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FOREWORD

From 1926 to 1956, the National Museum of Canada issued an Annual Report, which consisted of a statement of activities during the year together with, in most cases, a series of short accounts of research by members of the Museum staff or associates. Since 1957 the administrative report of the Museum has been included in the Annual Report of the Department of Northern Affairs and National Resources. To provide for the publication of the kind of short paper which formerly appeared in the Annual Report, a series of "Contributions" has been established for anthropology, zoology, and botany, respectively. Each volume is distinguished from the others in the series by including in the title the year in which most of the work was done. Thus there have already appeared "Contributions to Anthropology, 1957" (N.M.C. Bulletin No. 162), "Contributions to Zoology, 1958" (N.M.C. Bulletin No. 166), and "Contributions to Botany, 1958" (N.M.C. Bulletin No. 160). The present volume is the second in the anthropology series of Contributions.

Unfortunately, in the period between cessation of the Annual Reports and the beginning of the various Contributions series, a large number of important manuscripts on anthropological subjects accumulated. These are now being published as rapidly as possible. As a result, however, a number of papers completed in 1957 or 1958 are only now appearing. It will be recognized that such papers do not necessarily represent the status of knowledge on the particular subject in 1960. Publication of the third volume, "Contributions to Anthropology, 1959", is going forward, and this will bring the series into line with those of zoology and botany.

L. S. RUSSELL,
Acting Director,
Human History Branch.

OTTAWA, June 10, 1960

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A CAPE DORSET CULTURE SITE ON THE WEST COAST OF UNGAVA BAY

By

William S. Laughlin[1] and William E. Taylor, Jr.[2]

ARCHÆOLOGY (*William E. Taylor, Jr.*)

Over the decades since Jenness (1925) first described the Dorset culture, there has been maintained a considerable debate on its essential nature and origin, and on the physical type of its people. Following Jenness, one group of writers interpreted Dorset as an Eskimo culture that occupied Greenland and the Canadian Eastern Arctic after migration from Alaska. A second body of scholars construed the Dorset culture as a northward migration and "Eskimoization" of an Indian population derived from the northeastern Archaic Pattern. This view was recently echoed in a paper read by Meldgaard to the 1956 meeting in Philadelphia of the International Congress of Anthropological and Ethnological Sciences (Meldgaard, n.d.). Recent work demonstrating a widespread pre-Dorset occupation in the eastern Arctic (Meldgaard, 1952, 1955; Giddings, 1956; Knuth, 1958; Larsen and Meldgaard, 1958; Taylor, n.d.) has provoked a third view on the nature and origin of the Dorset culture—in short, that it developed *in situ* from a Palæo-Eskimo or pre-Dorset base (Taylor, 1959). Although this view has received only the most brief presentation, it seems, in one variant or another, to be replacing the earlier interpretations in the minds of many arctic prehistorians.

This joint paper does not seek to debate Dorset origins, but it does seek to contribute to that problem by presenting the archæological context and physical anthropological data of the first human skeleton found in a Dorset culture provenience. The very limited implications of this single find favour the "Eskimo" view and weaken the "Indian" view of Dorset origins.

The site to be discussed here was found in July 1957 by a National Museum of Canada field party consisting of my wife and myself. We were taken to the site by Zachariasi, an Eskimo of the Payne Bay settlement, and were aided in the work by Mr. Howard Dove of the Payne Bay Hudson's Bay Company Post. The site is near the eastern end of Pamiok Island (60° 04'N., 69° 34'W.), which is a small, narrow, and rocky member of a small island cluster immediately east of Tuvalik Point, the north shoulder of Payne Bay. Because of an impending airlift to the Ungava interior we were only able to stay overnight on Pamiok Island.

At the eastern extremity of the island there are modern Eskimo campsites. Some 500 yards northwest of the nearest of these is the archæological site Ja-Ej-1, to which was given the name "Imaha." This name, an approximation of the local Eskimo term for "maybe," reflects a cautious acceptance

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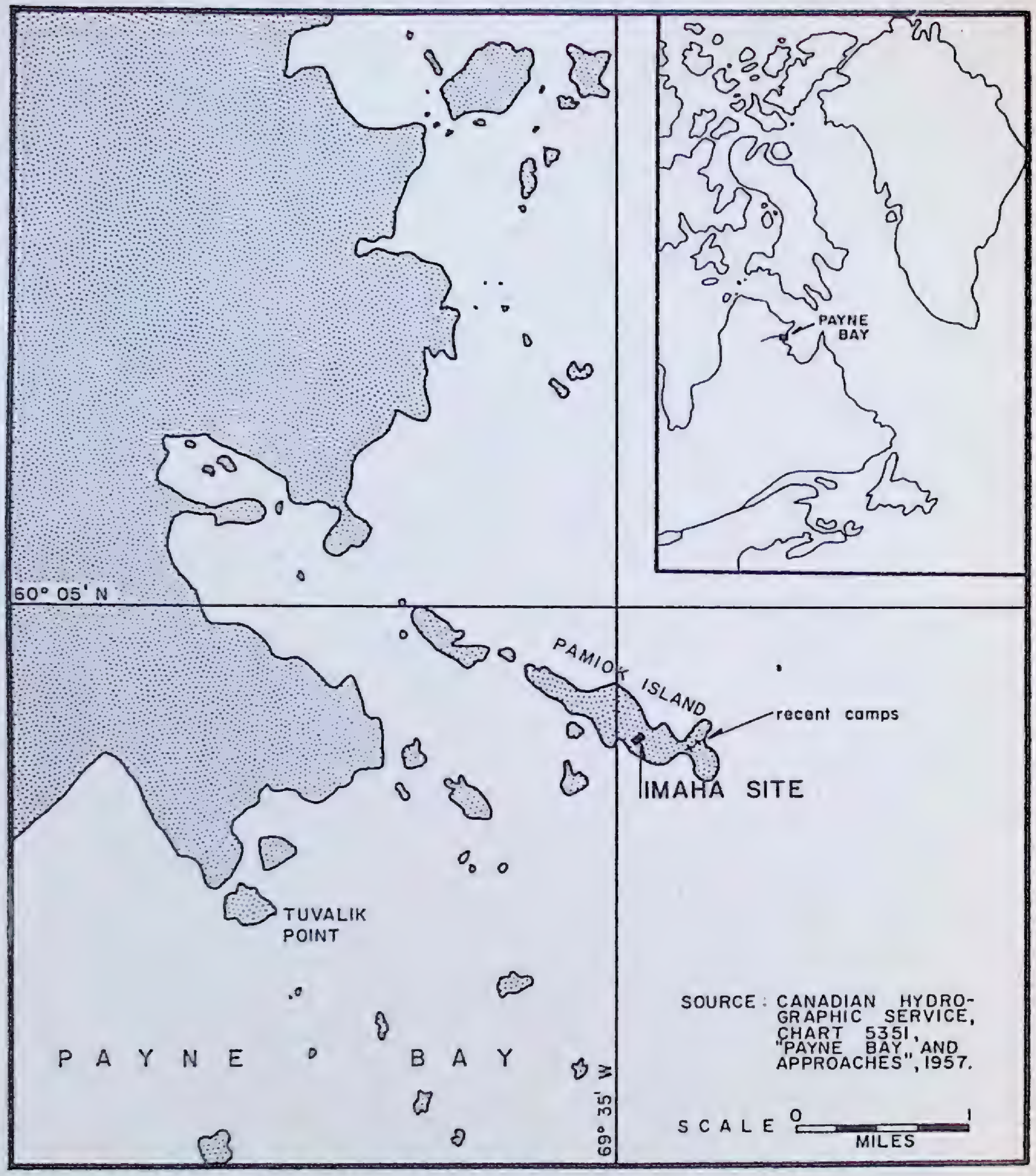

Figure 1. Location of the Imaha site.

of the archæological conclusions based on a small artifact sample in an archæologically little-known area. The site stands 26 feet above high-tide mark in a mossy, narrow trough. The trough, which is oriented northeast-southwest,[1] is bordered by outcrops (Plate I, fig. A). The site is about 300 feet back from a small cove on the southwest side of the island. It includes two burial vaults, destroyed food caches, and house structures of two kinds. There are several small, roughly circular tent rings made of large, lichen-covered rocks. These rocks are set together and rest slightly below present ground-level. Two of the tent rings, designated House 1 (Plate I, fig. B) and House 3, are in the trough and were excavated. A few others were noticed on the jumbled rock hills adjacent to the trough. The other house type, not excavated, is represented by a single, huge, semi-subterranean, rectangular ruin (Plate II). It is set in the trough with its long axis oriented northeast-southwest. Its overall measurements are 85 feet and 31 feet. Its perimeter is defined by low, broad ridges that form slightly convex sidewalls. Though the sidewalls are clearly defined, the endwalls are rather indistinct. These walls encompass a depression 75 feet by 18 feet which is liberally strewn with massive boulders that bear an abundant lichen growth. The areas between these boulders show a luxurious moss-grass vegetation. The central 45 feet of the house depression reaches a maximum depth of some 17 inches. An area 15 feet wide at each end of the depression is somewhat elevated and reaches depths of 9 and 12 inches respectively. Although these slightly elevated surfaces at the ends of the house depression vaguely recall oversized sleeping platforms, it would be reckless to conclude that such was their function.

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[1] All compass directions given for the site are magnetic. The compass declination in 1948 was about 44° West, decreasing 09' annually.

The dimensions of House 2 lead to speculation on its roofing and heating. Driftwood coming down the Payne or other rivers flowing into Ungava Bay from a treeline farther north is a possibility. With no concrete evidence at hand it is easy to speculate on the use of such a house as a ceremonial or dance house or as an extended family or multi-family residence. The proximity of the adjacent tent-ring structures provokes speculation in another direction—that of a seasonal shift between two house types.

The only surface artifact found on the site was a bone harpoon foreshaft socket-piece of recent type (Plate III, fig. Q). It was collected some 15 feet east of House 2. Test squares, 8 feet by 5 feet, were excavated 8 feet beyond the ends of House 2. The test square southwest of the house showed one inch of sod cover over a loose matrix of gravel and dirt and produced only a few bone scraps. The test square northeast of House 2 showed a 4-inch layer of moss and humus over loose gravel and dirt. In the moss-humus matrix were found six artifacts: a fragment of a large, stemmed, biface, chipped end blade made of black cherty quartzite (Plate III, fig. J); two quartz crystal microblade fragments with minute retouching on one edge (Plate III, fig. K, L); a quartzite snub-nosed end scraper with a convex edge and pointed corners (Plate III, fig. N); a convex-edged, snub-nosed end scraper, tanged for hafting and made of quartz crystal (Plate III, fig. M); and a quartzite flake showing extensive unifacial retouching (Plate III, fig. O). Also found, but not illustrated, were a quartz hammerstone and an abrading stone. There were also a few fragments of chipped stone waste (fine-grained black quartzite, cherty black quartzite, grey quartzite, quartz crystal, and amorphous quartz); three seal, two walrus, and two bearded-seal bones, and four bone scraps. The animal bone was so poorly preserved that the absence of non-lithic artifacts was no surprise. The artifacts in this test square all represent types known from Cape Dorset culture assemblages.

Immediately east of House 2, Zachariasi found a worked bone of nondescript form in the turf (Plate III, fig. P). It might have been used to soften boot soles.

House 1, a complete and richly lichen-encrusted stone ring, stands about 300 feet east-northeast of House 2 (Plate I, fig. B). It is slightly nearer sea-level than House 2 and is set on the low flank of the stone outcrop that forms the east side of the trough. Since the ring is complete and there was no sign of hearth, flagstones, entrance, or sleeping platform, the structure may well have been a storage cache rather than a dwelling. The sturdy ring formed by the stones constitutes a rough oval with interior diameters of 84 and 69 inches. A moss carpet, 1 to 1½ inches thick, covered the floor area except in the southeast corner where two square feet of surface had been dug up in recent years. When this moss cover was removed, a floor of coarse gravel and dirt was exposed. Resting on this surface and tangled in the roots were five bearded-seal bones, two seal bones, 15 bone fragments, nine fragments of chipped stone waste (fine-grained black quartzite, black cherty quartzite, grey quartzite, and amorphous quartz material), and five artifacts. These artifacts, which are of materials similar to those found in the test square, are illustrated in the second row of Plate III. The incipiently stemmed end blade, fig. E, is bifacially retouched and of black cherty quartzite. The side-notched end blade, fig. F, is also bifacially retouched but made of black, fine-grained quartzite. It has a minor secondary notch near the base. The opposite corner, which lacks a secondary notch, may have been broken but in its present state is retouched. The concavities of the major side notches have been carefully ground, presumably to prevent cutting of a lashing. Fig. G is a flake of amorphous quartz with retouching on the upper surface of its base and right edge and along the underside of its left edge. Fig. I is a quartzite, convex-edged, snub-nosed end scraper with lateral retouching, hafting tang, and "S"-curve on the unretouched inner main flake surface. Fig. H, also a convex-edged, snub-nosed end scraper, is of cherty quartzite with overall retouching on the upper surface. On the left underside, its bulb of percussion has been partially removed by retouching, although, again, the "S"-curve of the inner main flake surface is present. The typological affinity of these five artifacts is to the Cape Dorset culture.

House 3, which duplicates House 1 in appearance, stands halfway between Houses 1 and 2. Its moss-covered floor area had been somewhat disturbed prior to excavation. Only a few bits of eroded animal bone were found in this structure.

Burial 1 rests on the low flank of a rock outcrop, 15 feet southeast of House 1, and like House 2 is 26 feet above high-tide mark. The burial vault was an extensive rough oval of massive schistose slabs and granitic boulders. The horizontal slabs covering the top of the vault were complete and in place. The whole exterior was liberally encrusted with lichens (Plate I, fig. C). There was no evidence of disturbance on the exterior. The interior of the vault formed a narrow rectangle 75 inches long, with a width varying from 20 to 28 inches. The maximum interior height of the vault was 28 inches. The interior heights at the ends of the vault were 18 and 20 inches respectively. The long axis of this vault is oriented northeast-southwest. The human skeleton, incomplete and very much scattered, rested, for the most part, on the gravel and humus floor of the vault. No bones were found in articulation. Since the burial vault was intact and its lichen-cover uniform, one may assume that small mammals had scattered the skeleton. Many of the bones were covered or partly covered by a moss vegetation. Most of the phalanges were in the gravel floor of the vault, and a few of the larger bones were partly covered by dirt as well as moss. After the visible bones and vegetation had been removed, the gravel-humus floor was very carefully excavated in search of small bones, teeth, and artifacts. In addition to a few phalanges and teeth in the uppermost two inches of this matrix, some artifacts were also found. The artifacts appear on Plate III, fig. A to D. Fig. A is a large, triangular, concave-based end blade of bifacially retouched, black, cherty quartzite. It is a great deal larger than the concave-based triangular end blades commonly found on Dorset culture sites and interpreted as harpoon end blades. Fig. B is a thick flake of black cherty quartzite which has been marginally retouched as a scraper. A black quartzite flake that has been subject to bifacial percussion retouching is shown in fig. C. Fig. D illustrates another flake of black cherty quartzite with use-scars that suggest function as an end scraper. No other artifactual material was found with Burial 1. The position of the bones and artifacts and the interior dimensions of the vault imply a single extended burial with the body placed on the surface and the stone vault built around and over it. The associated artifact sample is very small but suggestive of Cape Dorset culture.

Several other features must be noted. There are several disassembled stone meat caches and a second lichen-covered burial vault immediately east of House 2 (Plate II). Other burials were noted scattered around the southeast tip of the island; their stone construction was generally much less ambitious than that of Burial 1; lichen had accumulated less on them; almost all had been diligently rifled in recent years; only two contained skeletons, and one of these appeared to be quite recent. These observations are most likely incomplete, for the party was on the island for less than 24 hours and was too much occupied with the area of Houses 1, 2, and 3 to search for additional work.

In summarizing the Imaha site materials, the two bone artifacts may be safely ignored, for one is of no analytic import, and the other is a single surface find of markedly different cultural affinity. Thus there remain 15 stone artifacts and chipped rejectage from three positions within a very restricted geographic setting, as well as 14 identified sea mammal bones, a human skeleton, and unidentified bone scraps. The human skeleton will be discussed separately. The presence only of seal, walrus, and bearded-seal bones suggests a sea-mammal hunting economy as does the site location. The artifacts and lithic rejectage enjoy a remarkable commonality of raw materials. In addition, the artifacts show a similarity of lithic techniques and some similarity of form. It seems reasonable, therefore, to treat the material as a single assemblage. The unity of the assemblage, suggested by its raw material, restricted provenience, artifact forms, and lithic techniques, is reinforced by a fifth factor: that the excessive lichen growth occurred consistently and uniformly on the rocks of Burial 1 and of Houses 1, 2, and 3. The quartz crystal microblades, the chipped biface end blades (sidenotched, stemmed, and concave-based triangular), and the several end scraper types represented are all forms well known from Dorset culture samples. Therefore, despite our present restricted knowledge of Ungava archæology, it *seems* reasonable to conclude that the Imaha site is a Dorset culture station and that the associated skeleton in Burial 1 represents an individual of the Dorset culture.

Although the Dorset culture existed from about 900 B.C. until A.D. 1300 (Rainey & Ralph, 1959), the artifacts of this sample do not facilitate a more precise chronological assessment of the Imaha site occupation. Nor does the site elevation provide a temporal clue since we later found on Sugluk Island, some 250 miles to the northwest, both early and late Dorset sites at the same elevation above sea-level as the Imaha site.

Discussing a Dorset sequence from Foxe Basin, Meldgaard notes, "though a number of very large 'communal houses' are found from quite early in the sequence, Period III, houses which measure up to 14 by 7 meters" (1955, p. 174). If one assumes a single occupation of the Imaha site and extrapolates Meldgaard's observation, the size of House 2 would suggest that the Imaha site falls "quite early" in the Dorset sequence. Again from Meldgaard's data, the absence of entrance passages would indicate that the Imaha occupation was not late Dorset in time. However, with the general region so poorly known and Meldgaard's work some 700 miles away, these are very tenuous indications at best.

This site, of course, merits further work if only to explore the grave vault east of House 2 (Plate II). In addition, Zachariasi claimed he knew of two other positions along the coast north from Payne Bay where houses similar to House 2 existed. Unfortunately, he found difficulty in correlating his geographical knowledge with our topographic maps, and as a result no precise location of these two other sites was obtained. One large old rectangular house ruin with internal partitions was, he thought, on a very tiny island, "Iagoktok," about six miles south-southeast of the Cape Hopes Advance station, and at about 61°01'N. and 69°29'W. That would be about sixty-five miles north of the Imaha site. The second site in Zachariasi's recollection consisted of two very old large rectangular house ruins, again on an islet, "Ogligjuak," one of a small group situated just off the mainland about three miles north of Pamiok Island and the Imaha site. Finally, Mr. William T. Larmour, Department of Northern Affairs and National Resources, informed me of the existence of four round house depressions associated with graves about twelve miles north-northeast of Pamiok Island. This, another offshore island, is about one mile by one-quarter mile in size, located approximately at 60° 14'N. and 69° 28'W.

PHYSICAL ANTHROPOLOGY (*William S. Laughlin*)

Physical identification of the bearers of the Dorset culture has been an intriguing question since the first description of the Dorset culture in 1925 by Dr. Diamond Jenness. That they should prove to be another variant of Eskimos, most similar to contiguous groups, seems likely in view of the known variation between the several groups composing the Eskimo-Aleut stock (Laughlin, 1951). In addition to the variation from west to east within this stock, there is the known archæological succession of physical types in the Aleutians, southwestern Alaska, Bering Strait, and Labrador. Another logical possibility has to be recognized, that the Dorset people might be quite another kind of population, including the status of a group ancestral to Eskimos and Indians. Still another possibility, though admittedly less likely on the basis of anthropological evidence, is that of finding an Indian rather than Eskimo physical type. The discovery of this skeleton (Ja-Ej-1, Burial 1) by William E. Taylor affords us the opportunity of examining in detail one Dorset man whose cultural context is defined and of thereby assessing the physical affinities of the Dorset people. It is but a beginning, as with only one specimen we cannot describe the range of variation within the breeding community, of which this is but one member, and thus we cannot estimate the degree of similarity between a Dorset-breeding isolate and other isolates. To state the conclusion in the preface, this skeleton indubitably appears to be the skeleton of an Eskimo. We are fortunate in having an unambiguous skeleton, for it does indicate a greater likelihood that other Dorset people were Eskimo in physical appearance. It also facilitates the task of describing and assigning this particular skeleton. It will be of considerable interest in the future to see how much variation there is between different groups of Dorset Eskimos.

Physical Remains

The skeleton consists of the skull (cranium and mandible); portions of six cervical vertebrae; the scapulae; left clavicle; both femora, tibiae, and fibulae; an intact left and partial right calcaneum; both astragali, cuboid, and naviculars of the foot; the first left cuneiform, right and left second cuneiforms, and a third, probably right, cuneiform, the second through fifth metatarsals of the right foot, and the first, fourth, and fifth of the left foot, and five phalanges; the right humerus; both ulnae and radii; right navicular, lunate, capitate, and hamate of the hand; the second through fifth metacarpals of the right hand, and the first and probably second and third metacarpals of the left hand. Two additional fragments probably belong to the left hand. Three phalanges complete the inventory.

The skeleton appears to have been partially exposed and is covered with lichens in several parts. Many of the bones are fragmentary and thus not suitable for measurement.

Skull

The skull is that of a male whose age probably falls in the range between 35 and 45 years. In the absence of innominate bones, this can neither be confirmed nor be made any more precise. The greater part of the coronal, sagittal, and lambdoid sutures are closed endocranially. *Pars obelica* of the sagittal suture remains open as does *pars asterica* of the lambdoid suture. There are only slight hints of union in the circum-meatal sutures. The extensive dental attrition is in agreement with a minimum age estimate of 35 years, and the skull may be reliably that of a middle-aged adult.

The sex is easily specified as male, by virtue of the prominent supra-orbital ridges, large and rugose mastoids, well-defined supra-mastoid crests, and the generally large size and extensive muscular marking. The bilateral chin eminence and eversion of the gonials with the large size of the mandible confirm the sex identification. The massiveness of the long bones is in agreement with the evidence from the skull.

In form, the skull is dolichocranial (70.3), hypsicranial (75.7), and acrocranial (107.7). The narrow width of the vault (130 mm) provides the customary contrast with the broad face (142 mm) seen in Central and Eastern Eskimos. The bigonial diameter of the mandible is similarly broad. The measurement of 121 mm does not represent a true diameter, inasmuch as the mandible has been sprung and possibly widened as much as 10 to 15 mm. There is marked eversion of the angles and considerable rugosity indicative of heavy muscle attachment. The minimum breadth of the ascending ramus (40 mm) is broad.

Viewed from the front, the vault rises to a sagittal keel from relatively straight sides. Viewed from below, the large palate and powerfully developed malars stand out. The occipital portion reduces uniformly to form a tuber occipital.

Face

The face is broad and high, though absence of occlusion and resorption of the alveolar margins does not permit an accurate measurement of facial height. The suborbital fossae are shallow. There are two accessory infraorbital foramina, one above and medial to each of the infra-orbital foramina. Fürst and Hansen (1915) commented on the frequency of these foramina in their synopsis of anthropological characters under point number 21. Jørgensen and I similarly noted their high frequency in Greenlandic crania but have no accurate count. It may be worth noting the suggestion that such accessory foramina are worth investigation, for they may provide additional blood supply to the face and thus serve as an additional means of warming this exposed area. The lower margins of the zygomatic arches are everted. There is a pit in addition to a roughened area for muscle attachment on the inferior surface. The zygomatic arches at this point are 11 mm thick on the left side and 12 mm thick on the right. Such massive development is much more characteristic of Eskimos than of Indians.

The nasal bones are extraordinarily narrow at the point of their intersection with the frontal bone, being only 2 mm in width. It appears from external observation that the left nasal bone elides with the right before reaching the frontal bone. While this upper nasalia breadth of Eskimos is commonly narrow, and the Eskimos have the narrowest nasal bones of all races, this appears to be an extreme value. The inferior margins of the nasal bones, especially the left, and the left margin of the pyriform aperture may have been raised and slightly distorted by post-mortem pressures. The nose is platyrrhine with an index of 54.2. Nasal height falls within the bottom range of the Old Stone Grave Series, and the breadth falls in the upper end of the range. The index, however, exceeds the range (Table I). When the face as a whole is considered, it is seen that all the lateral diameters are large, the bizygomatic, orbital, nasal, palatal, and bigonial breadths.

TABLE I

MEASUREMENTS OF THE DORSET CRANIUM, OLD STONE GRAVE SERIES AND RECENT GRAVE SERIES, MALES[1]

NOTE: Parentheses indicate some damage to landmarks used for measurement.

	Dorset Ja-Ej-1	Old Stone Grave Series Eskimo			Recent Eskimo No. 12
		No.	Range	Mean	
Glabello-occipital length....	185.0	38	171–202	187.7	185.7
Maximum breadth........	130.0	34	128–144	134.6	134.4
Basion-bregma height......	140.0	31	128–145	136.0	134.1
Cranial index.............	70.3	34	64.5–77.9	71.8	72.6
Length-height index.......	75.7	31	67.4–79.2	72.5	72.7
Breadth-height index......	107.7	27	92.8–110.2	101.1	99.8
Mean-height index........	88.9	27	78.1–90.3	84.4	84.1
Cranial module...........	151.7	27	145.0–158.3	152.7	151.0
Minimum frontal breadth..	98.0	31	90–106	95.3	92.2
Bizygomatic breadth......	142.0	28	126–150	136.5	133.0
Basion-nasion.............	103.0	30	88–113	103.0	100.9
Basion-prosthion..........	(103.0)	28	93–111	101.6	100.2
Orbital height, mean.......	34.5	29	32.5–40.8	36.0	35.8
Orbital breadth, mean.....	41.5	27	37.2–45.0	40.2	38.8
Orbital index, mean.......	83.1	27	82.3–100.0	89.5	92.5
Nasal height..............	48.0	31	48–58	52.4	50.9
Nasal breadth............	26.0	31	18–26	22.6	22.5
Nasal index..............	54.2	31	32.7–50.0	43.1	44.3
External palatal length....	(54.0)	25	49–60	54.0	55.0
External palatal breadth...	67.0	22	57–68	63.9	63.0
Palatal index.............	124.1	22	110.0–136.7	118.4	114.8

[1] The figures for the Old Stone Grave Series and for the Recent Grave Series are drawn from T. Dale Stewart, 1939.

MANDIBLE

Aside from its large size, eversion of the gonial angles, and broad bilateral chin eminence, previously noted, the most noteworthy aspect of this mandible is the occurrence of the mandibular torus on the lingual surface. The torus is of medium size, rather nodular than elongated in form, though not so sharply defined as in Norse mandibles. It is most prominent in the region of the second premolar and first molar. It appears to rise to the upper level of the alveolar margins and elides with the mylohyoid lines at its lower margins, the lines apparently extending onto its lower portions. The torus on the right half of the mandible is slightly more marked in relief than that on the left. However, resorption of bone owing to loss of teeth does not permit precise measurement. The total thickness at the highest point on the torus is 14 mm; immediately in front of the torus the mandibular thickness is 10 mm.

Much significance attaches to the mandibular torus, for it is genetic in origin and is found in remarkably high frequency in various Eskimo isolates as well as in other Mongoloid peoples and in some north Europeans such as old Norse, Icelanders, Norwegians, and Lapps. Though many early researchers subscribed to a functional origin for these prominences (Fürst and Hansen, 1915; Hooton, 1918; Hrdlicka, 1930), in most cases they also acknowledged its occurrence in young people or in children. However, as early as 1923, Ritchie, in a study of "The Dentition of the Western and Central Eskimos," provided an excellent criticism of the idea that these tori develop in response to functional demands. Two of his points especially are worth exhuming: the pressure is greatest in the molar region, and here the tori are absent or slight in development; some corresponding development ought to be found in the maxilla. There is now literature on the genetics of this trait, though the precise mode of inheritance is not known (Lasker, 1950; Moorrees, 1952, 1957). The essential points are that it can be traced genealogically, that there is a sex difference (more frequent in Eskimo males than females, though the females clearly show more attrition at earlier ages), that it occurs in young children long before any great demands have been made upon the masticatory apparatus, that there are isolate and population differences even where diets and habits of mastication are similar or identical, and that the mechanical explanation is inadequate even on purely mechanical grounds.

Dentition

The remaining teeth—the upper second premolars, first molars, and second molar of the left side, and the canines and first premolars of the mandible—all show extensive attrition so that no enamel remains on the occlusal surfaces and the pulp cavities in all but the second upper left molar have been exposed. In addition to these teeth in place, there are the two upper third molars which were recovered separately. The unworn condition of their occlusal surfaces indicates that these teeth had not erupted during the lifetime of the individual. The skull apparently rested on its base so that when the soft tissues had decayed the third molars then dropped to the ground. Failure of third molars to erupt is especially common in Eskimos (Dahlberg, 1951). Dahlberg notes that 16 per cent of Labrador Eskimo skulls at the Chicago Natural History Museum have one or more missing. Shallow sockets are present, so that in the actual absence of recovery of the teeth they would have been reported as present. Fortunately, the recovery of these molars indicates strongly that they never got into position and probably had not emerged through the gums.

The molars are of great size. The labio-lingual diameter of the upper right first molar is 14 mm, and the meso-distal diameter is 9.8 mm.

Discrete Traits

Though these traits are often included under the category of 'nonmetrical' observation, it is useful for analytical purposes to distinguish those which phenotypically fall into a present or absent category. Reference has already been made to the accessory suborbital foramina and to the mandibular torus. For comparative data on the latter, the following information is supplied by Stewart (1939, p. 52):

> Regarding the mandibular torus there is the following information:
>
> | | | |
> |---|---|---|
> | Labrador and St. Lawrence Island jaws (31) | present in 87.1% | Hooton (1918) |
> | Greenland jaws (large number) | present in 80.0% | Fürst (1908) |
> | Labrador jaws (18) | present in 50.0% | Russell and Huxley (1899) |
>
> Many other records could be added, but this is sufficient to show the general frequency among the Eskimos. I made no detailed observations on this feature, but did note when it interfered with measurements of thickness of the horizontal ramus at the second molar. There was one such case (slight) among the jaws from recent graves (18) and 6 (2 marked) among those from old stone graves (31). Fischer-Møller (1937) notes merely that "in several cases the Naujan skulls and those from Baffin Island exhibit this peculiarity" (p. 49).

Frequency figures for medium and greater development of the mandibular torus in the four regional isolates of Greenland are given in Table II.

In our Dorset culture skull, the palatine torus is of slight development, insufficient to have been recorded as present in the table of Greenlandic frequencies. Stewart notes this torus in 34.8 per cent of 46 Old Stone Grave skulls, 15.4 per cent of 13 Recent Grave skulls, and "Of theLabrador specimens only one showed a torus of more than slight development" (*ibid.*).

Other discrete traits include the following: one left parietal foramen, dehiscences (one large on the left tympanic plate and a small one on the right), a slight pharyngeal tubercle, one left and two right supraorbital notches in addition to the left supraorbital foramen previously mentioned, some three Wormian bones in the left portion of the lambdoid suture, the right portion being partially obliterated, posterior condyloid foramina, and a right turn of the superior sagittal sinus.

Stewart finds four occurrences of a left parietal foramina out of a total of 11, in the Recent Grave series, and three out of a total of 21 occurrences in the Stone Grave series of males. For dehiscences he notes 29.2 per cent in the Stone Grave series and 16.7 per cent in the Recent Grave series.

Measurements and Observations on the Long Bones

The long bones of this skeleton are large and powerfully developed, as seen in the high midshaft indices and the muscular markings. Comparative series are even smaller than for the cranium.

The humerus, with a maximum length of 317 mm, exceeds by one millimetre the longest of the Recent Grave Series, which ranges from 275 to 316 mm for 11 specimens. The midshaft diameters are both large, minimum 20 mm and maximum 26 mm, and the resulting index of 76.9 falls within the Recent Grave Series, 66.7 to 86.4, and the Old Grave series, 66.7 to 85.7.

The radius, also of the right arm, is short, 221 mm. It is not likely that the pathology involving the elbow region has affected this length measurement. The seven Recent Grave specimens range from 193 to 224 mm, and the three Old Grave specimens are 202, 220, and 235 mm. Stewart noted the shortness of the forearm in Labrador and reports that Fischer-Møller noted the same thing, though less extreme, in his Thule and Greenland series (Stewart, 1939, p. 56). The resulting humero-radial index of 69.7 is low. The range for six male right forearms of the Recent Grave series is 69 to 73.3 mm with a mean of 71.2 mm. Eastern Arctic indices are lower than those of the old Igloo series and Stewart attributes this to the "exceedingly short radius in the eastern Arctic."

The maximum length of the left femur is 429 mm, and the bicondylar length is 426 mm. Loss of cortical bone on the head may have subtracted one millimetre from the maximum length. In any event the length is quite within the range of all the eastern Arctic series. The range of the Recent Grave Series is 390 to 442 mm (12 specimens) and for eleven Old Grave specimens, 402 to 450 mm. The sub-trochanteric diameters are as follows: antero-posterior, 27 mm; transverse, 31; and the resulting platymeric index is 87.1. The same diameters for the right femur are 28 mm and 30 mm, respectively. The mid-shaft diameters of the left femur are, antero-posterior, 28; and transverse, 29; with a mid-shaft index of 96.6. The same diameters for the right femur are 29 and 29 mm, respectively. The stoutness of the femora is in agreement with other Eskimo series. There is no third trochanter; the gluteal crest is marked, and there is a marked hypotrochanteric fossa on both the right and left femora. The pilaster is also marked.

TABLE II

REGIONAL VARIATION IN DISCRETE TRAITS IN GREENLANDIC ESKIMO CRANIA

(after W. S. Laughlin and J. B. Jørgensen)

	NW		SW		SE		NE	
		%		%		%		%
Dehiscences	90/345	26.1	41/126	32.5	15/78	19.2	12/46	26.1
Supra-orbital foramina	206/342	60.2	74/127	58/3	46/78	58.9	22/46	47.8
Mandibular torus	110/159	69.2	28/43	65.1	12/27	44.4	17/19	89.5
Palatine torus	62/171	36.3	19/60	31.7	9/38	23.7	2/22	9.1

The left tibia has a maximum length, without spine, of 360 mm. The longest of twelve Recent Grave specimens is 356 mm, and of four Old Grave specimens is 358 mm. The mid-shaft diameters are—antero-posterior, 29 mm; and transverse, 22 mm; with an index of 75.9. These latter measurements and indices fall within the range of the existing Labrador series.

The femero-tibial index of our Dorset specimen is 81.6, for the left tibia and femur. This figure is exceeded by two Recent Graves indices. Only one index for an Old Stone Grave specimen is cited by Stewart, 80.8.

One of the interesting findings of Stewart in his study of the Labrador series was the apparent decrease in stature since the eighteenth century (Stewart, 1939, p. 65). It will be of major interest to determine whether the Dorset people were generally taller than their successors and whether the recent decrease reflects a long-term trend. Comparison of the Old Igloo series (Birnirk) with later series suggests a decrease in north Alaska, and a similar decrease in the Aleutians and in Kodiak Island was noted by Hrdlicka (1945). In the latter cases the amount of difference may not be accurate, in spite of the very large series, owing to the fact that the skeletons were not treated on a purely stratigraphic basis; nevertheless the trend toward decrease is probably correctly observed.

Pathology

The second and third cervical vertebrae are solidly fused in their articular processes, but the bodies are separate from each other. As the laminae, spinous processes, and cortical bone in various areas have been lost, no more can be said about the extent of this synarthrosis. The remaining cervical vertebrae are fragmentary and also are in such a defective condition that little information can be secured from them. No other vertebrae are present.

The right humerus, powerfully developed in all its dimensions, displays new bone growth that may reflect an interarticular fracture or similar trauma in its lower extremity. On the anterior surface the radial fossa has been filled in with new bone, and the coronoid fossa has been reduced in size by the addition of bone. The olecranon fossa on the posterior surface has been partially filled in by the growth of bone and clearly did not permit complete extension of the forearm on the upper arm. There is extensive lipping on the margins of the condylar surfaces and an invasion of the capitular surface by a pronounced exostosis. The arm was carried in a semi-extended position with some flexion possible. Owing to the defective condition of the radius, it is not possible to determine whether the partial destruction of its head was involved in this pathology or whether it is simply the result of post-mortem deterioration. There is lipping on the inferior margin of the radial head. Exostoses are present at the distal end of the ulna, but not in the remaining portion of radius. Aside from evidence of pathology the radius is of interest for its shortness, as is the ulna, and for the large size of the bicipital tuberosity and short neck. It may, of course, be possible that the superior extension of the bicipital tuberosity is related to the semi-flexed position of the arm, representing an adaptation to a new and relatively constant position.

Conclusions

The adult male skeleton examined here appears to be that of an Eskimo, a member of the Eskimo-Aleut racial group, and more particularly he may be designated an Eastern Eskimo. The following typical combination of traits is presented: narrow and high keeled vault, broad face with shallow suborbital fossae, extremely narrow nasal bones, large palate and teeth, dehiscences of the tympanic plate, incomplete emergence of the upper third molars, occipital squama forming a tuber occipital, mandibular torus and large mandible with gonial eversion. The measurements, indices, and intermembral proportions of the long bones are most similar to those of Labrador Eskimos and other eastern Eskimos, the most noteworthy characteristic being the short radius.

An examination of the physical anthropology of Indians permits exclusion of this specimen from such a category on both metric and morphological grounds (Howells, 1946; Knowles, 1937; Neumann, 1952; Stewart, 1939; Jørgensen, 1953). In spite of considerable and obvious differences in the skeleton, external morphology, dentition, and serology, the biological distance or dissimilarity between Eskimos and American Indians has sometimes been minimized, and their Asiatic affinities have been largely ignored. This was especially true in the 1920's and 1930's. The basis for such inaccurate estimates was simply sampling errors and inadequacies, in some cases, and failure to use all the forms of evidence available (Collins, 1945; Laughlin, 1950; Stewart, 1939). There are, of course, individual Eskimo skeletons that cannot be distinguished from individual Indian skeletons nor from individual Chukchee skeletons. The essential point is that many more similarities lie with the Asiatic varieties. We are fortunate in this case in having an unambiguous representative of the Dorset culture.

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PLATE I

Fig. A. Imaha site, Pamiok Island, at low tide. Small cove in foreground. Looking east-northeast.

Fig. B. House 1, Imaha site, after excavation, with House 2 in extreme upper right corner. Looking southwest.

Fig. C. Burial 1, Imaha site, prior to excavation. Looking north.

Plate I

A

B

C

Plate II

Composite view of House 2, looking east-southeast across the trough. Meat caches and a burial vault in the background.

Plate II

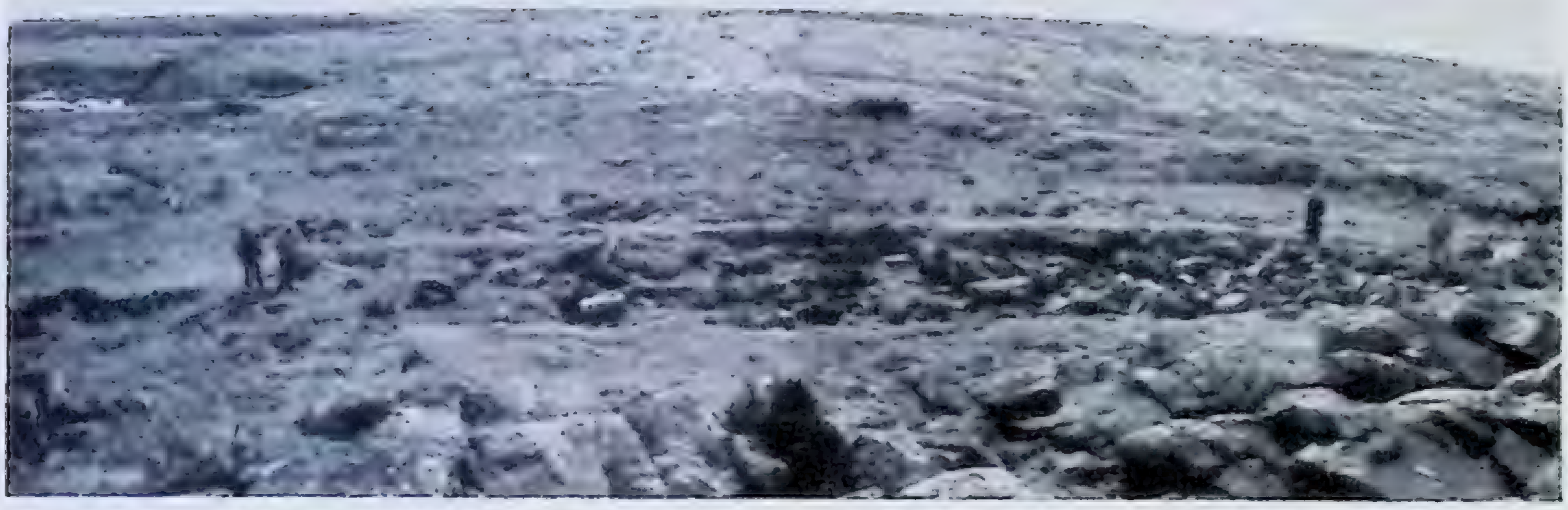
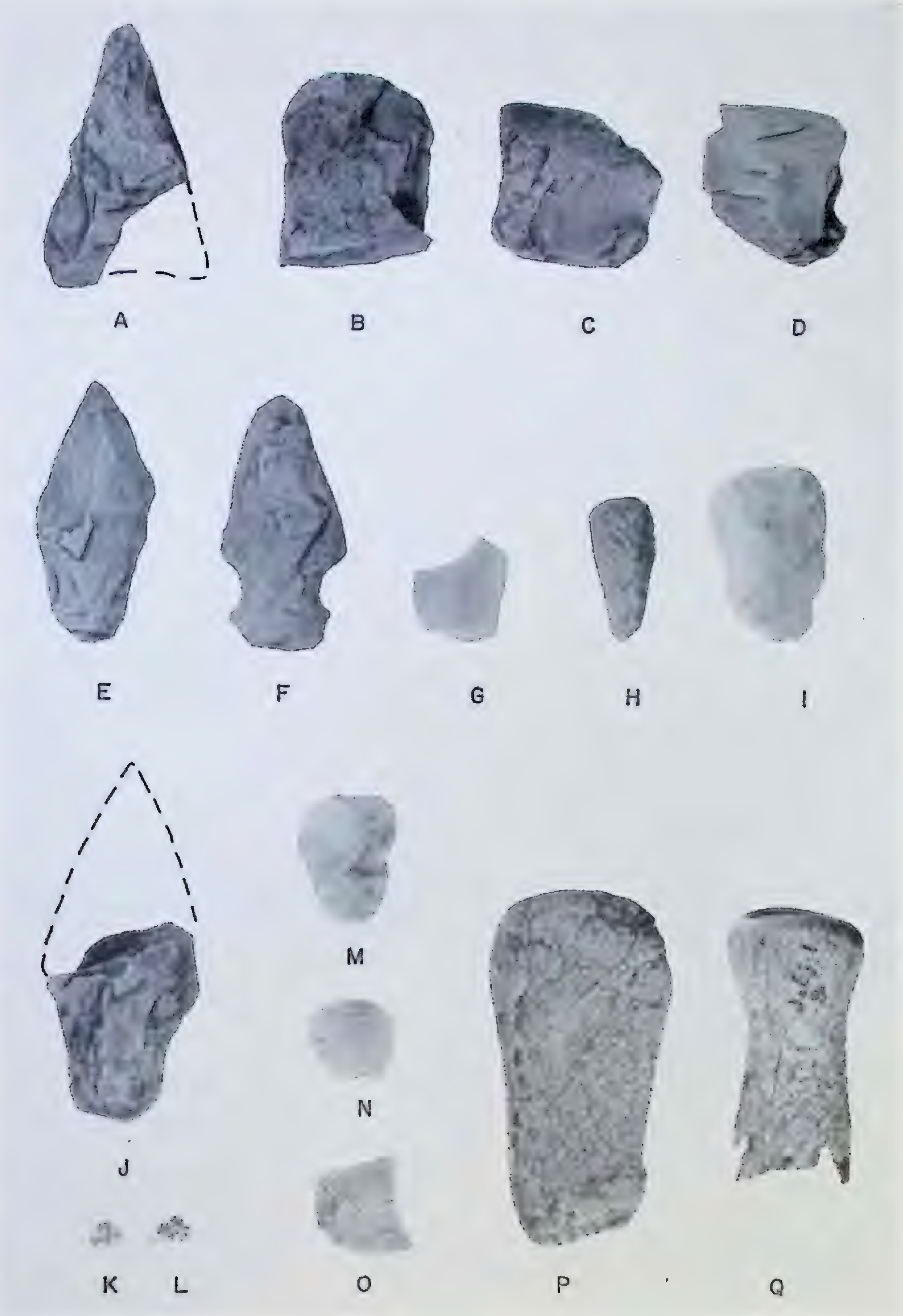


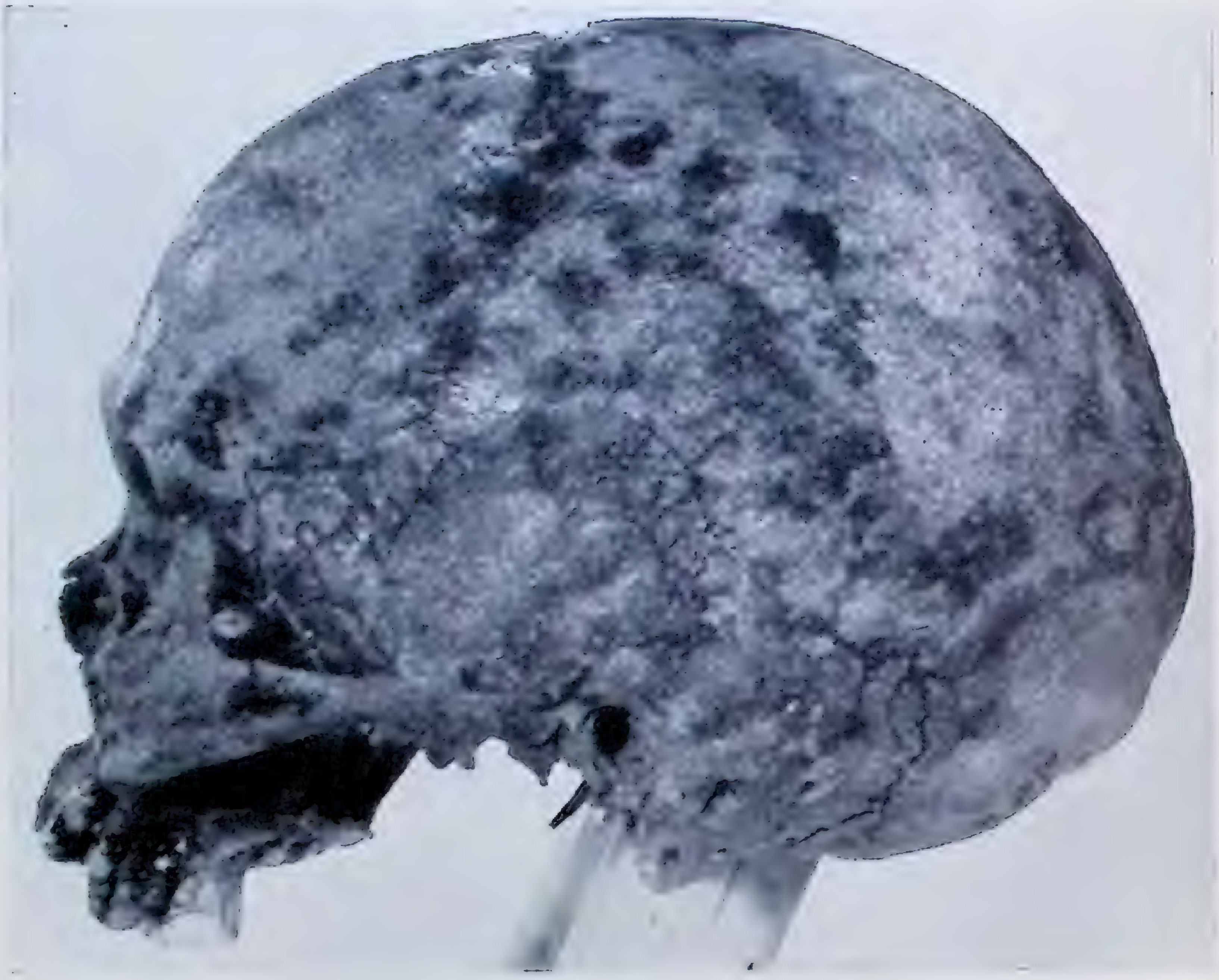
Plate III

(½ natural size)

Fig. A. Triangular end blade. Floor of Burial 1, Imaha site.
Fig. B. Retouched flake scraper. Floor of Burial 1, Imaha site.
Fig. C. Flake with percussion retouch. Floor of Burial 1, Imaha site.
Fig. D. Flake with use-scars. Floor of Burial 1, Imaha site.
Fig. E. Incipiently stemmed end blade. On floor of House 1.
Fig. F. Side-notched end blade. On floor of House 1.
Fig. G. Retouched flake. On floor of House 1.
Fig. H. End scraper. On floor of House 1.
Fig. I. End scraper. On floor of House 1.
Fig. J. Stemmed end blade. Test square, near House 2.
Fig. K. Quartz crystal microblade. Test square, near House 2.
Fig. L. Quartz crystal microblade. Test square, near House 2.
Fig. M. End scraper. Test square, near House 2.
Fig. N. End scraper. Test square, near House 2.
Fig. O. Retouched flake. Test square, near House 2.
Fig. P. Worked bone object. In turf, near House 2.
Fig. Q. Foreshaft socket piece, bone. On surface, near House 2.

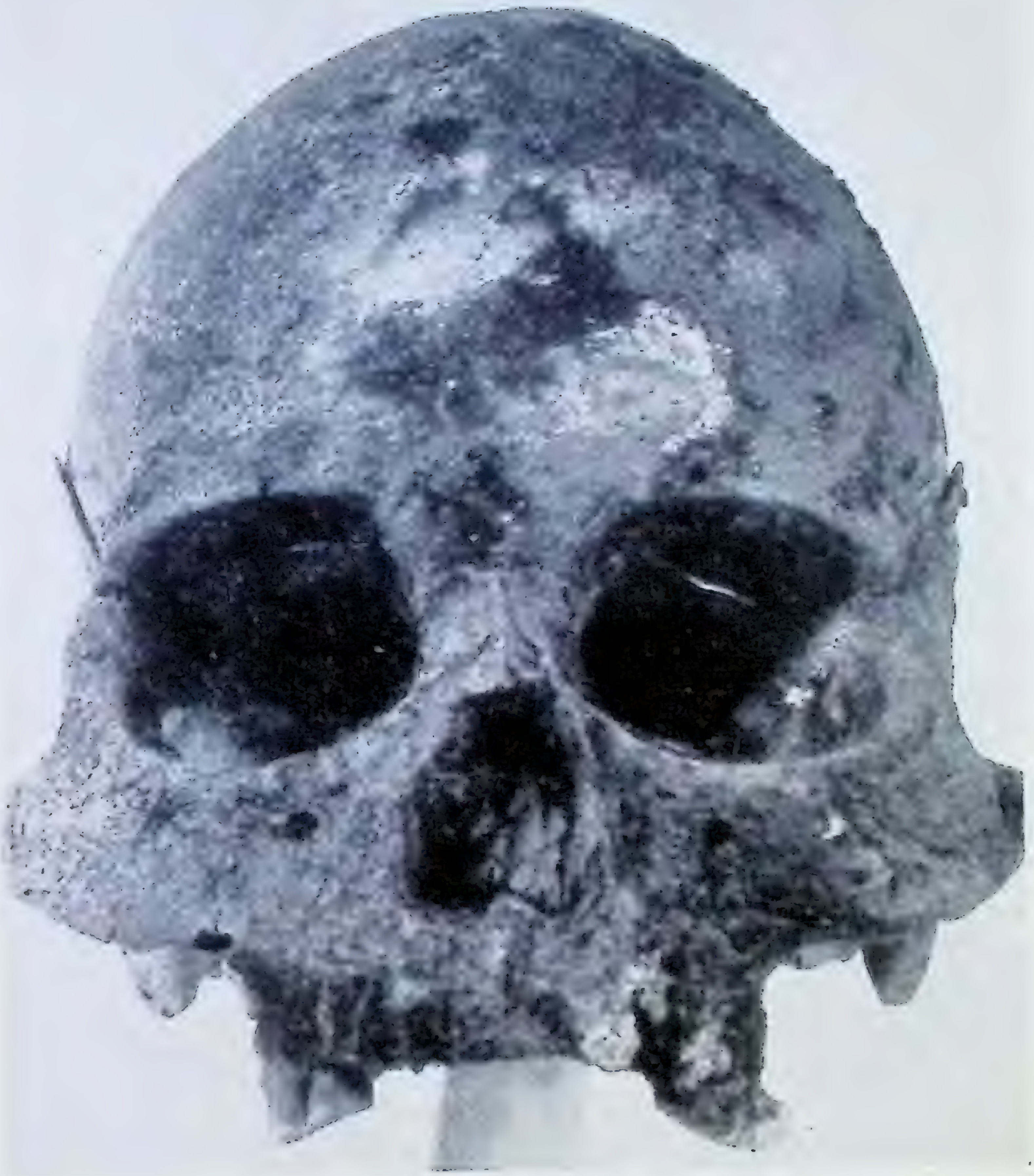
Plate III



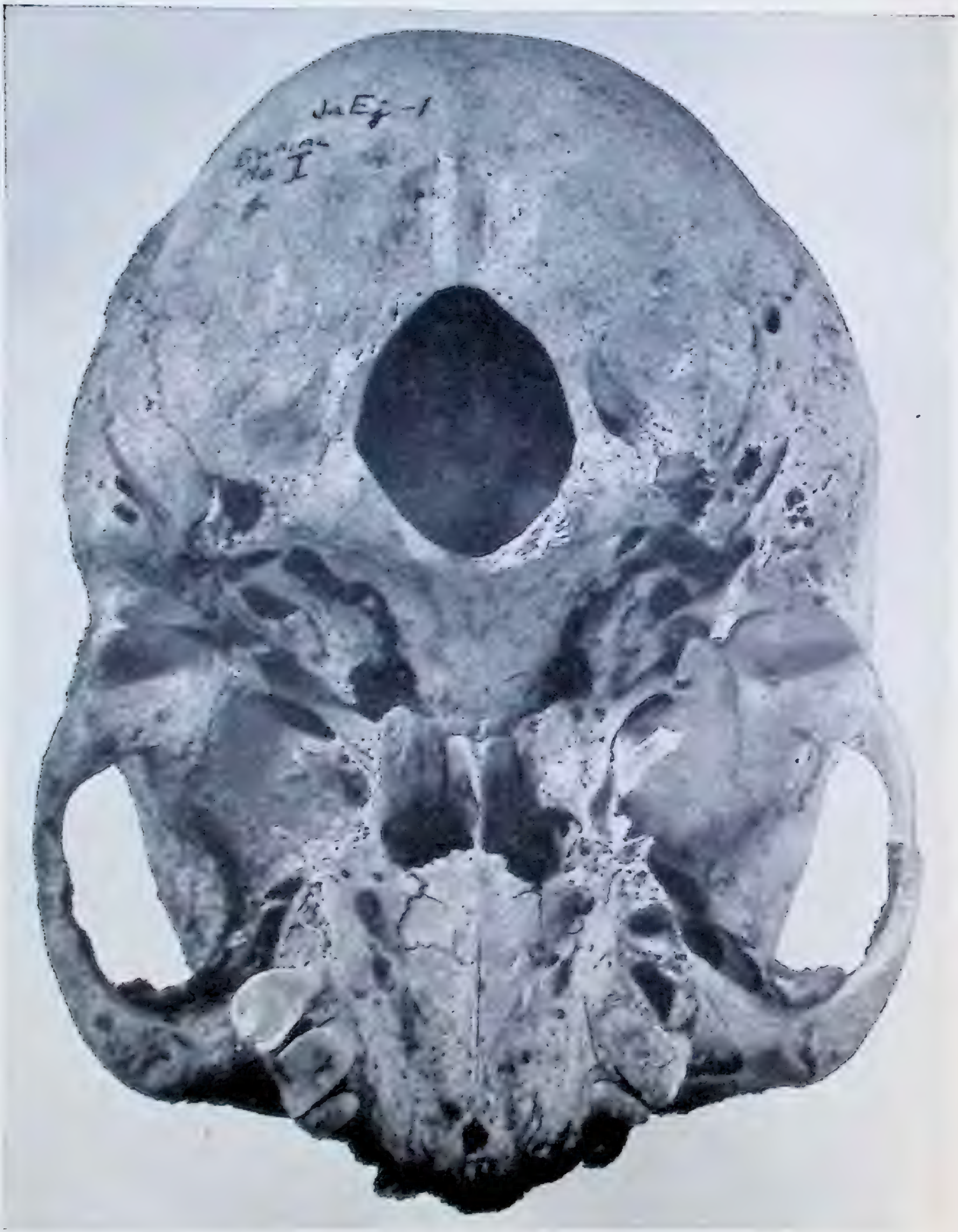


Skull of Burial 1, Imaha site, *norma lateralis*.

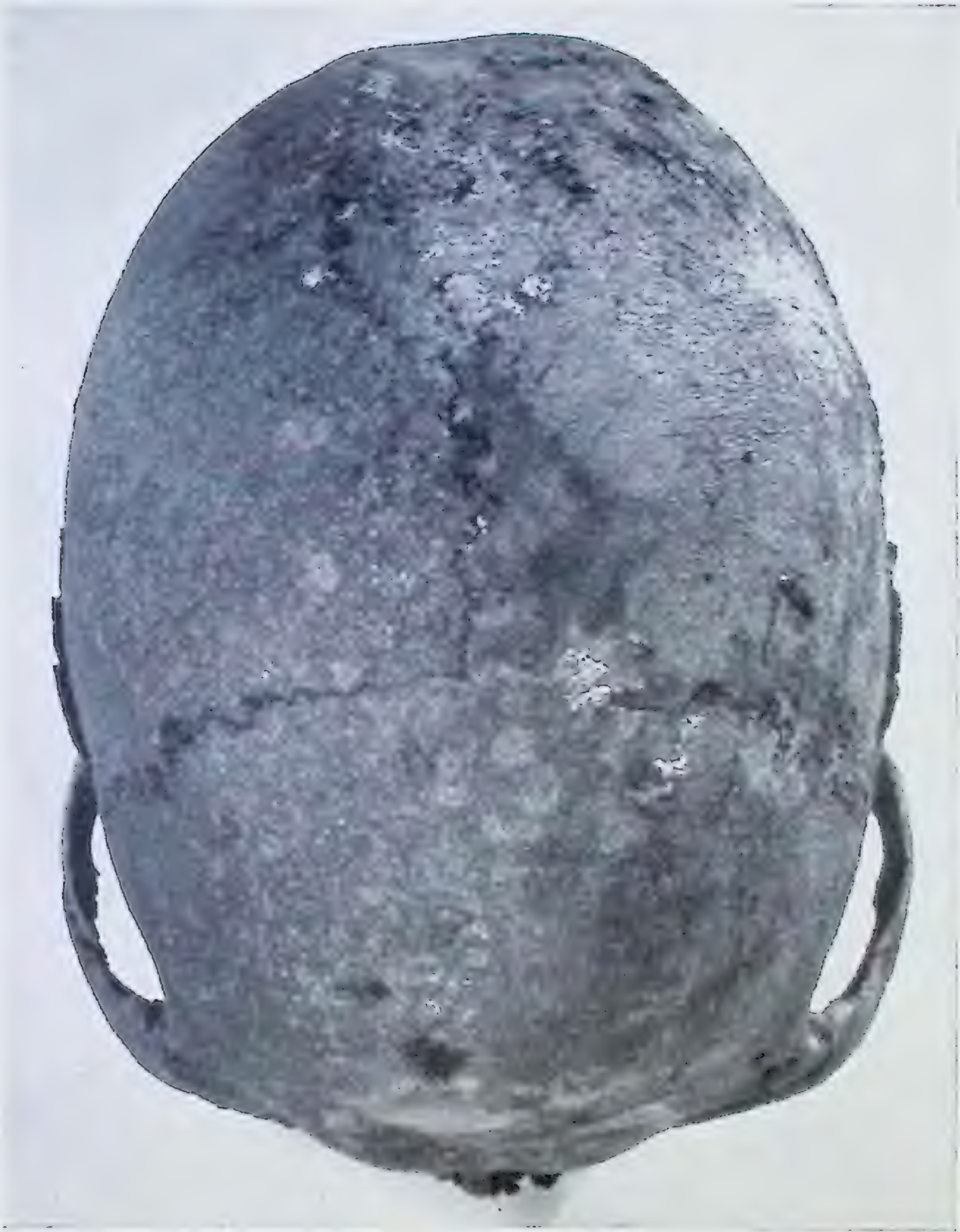
PLATE V



Skull of Burial 1, Imaha site, *norma facialis*.



Skull of Burial 1, Imaha site, *norma basalis.*



Skull of Burial 1, Imaha site, *norma verticalis*.

PLATE VIII

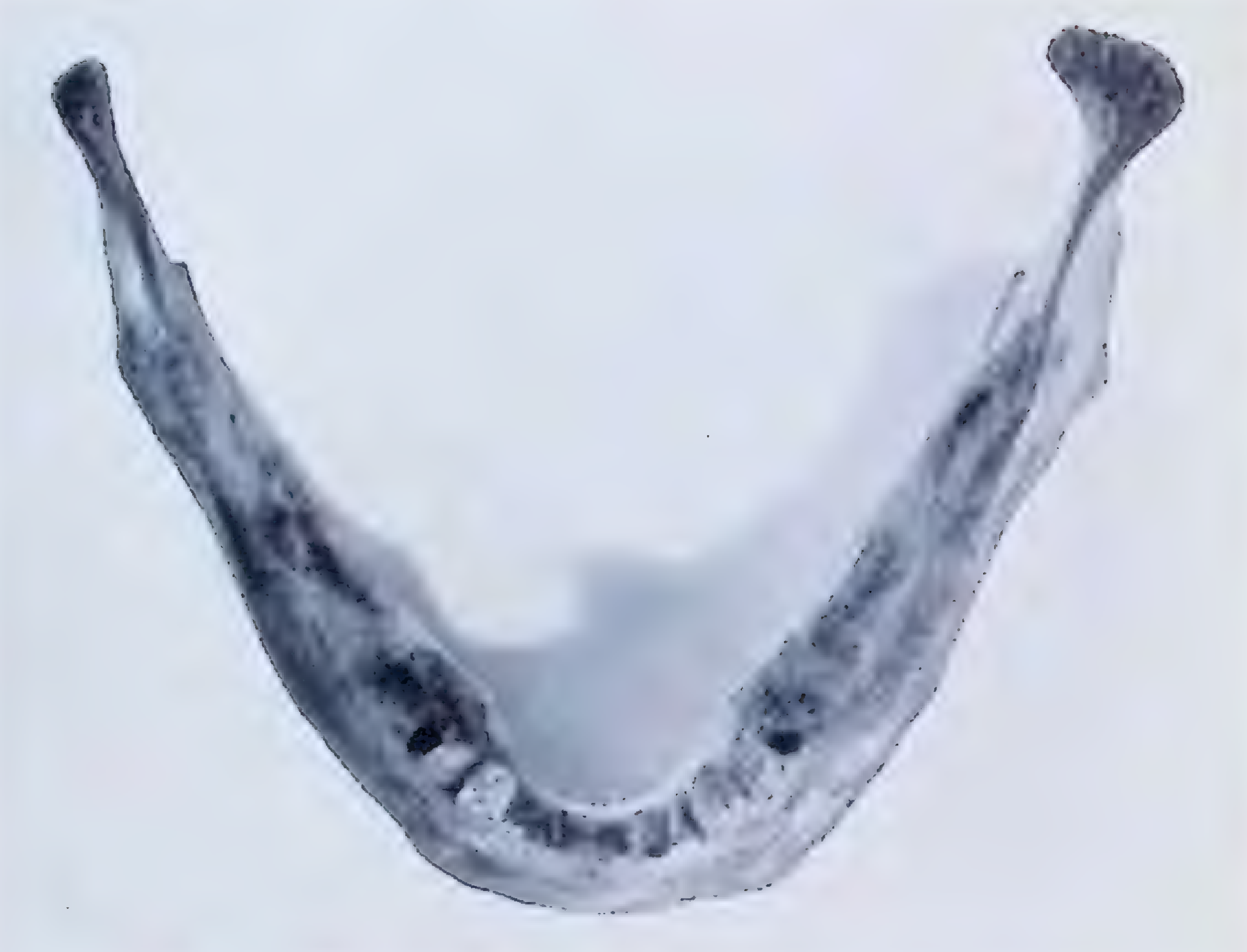


Fig. A. Mandible, Burial 1, Imaha site, occlusal view.

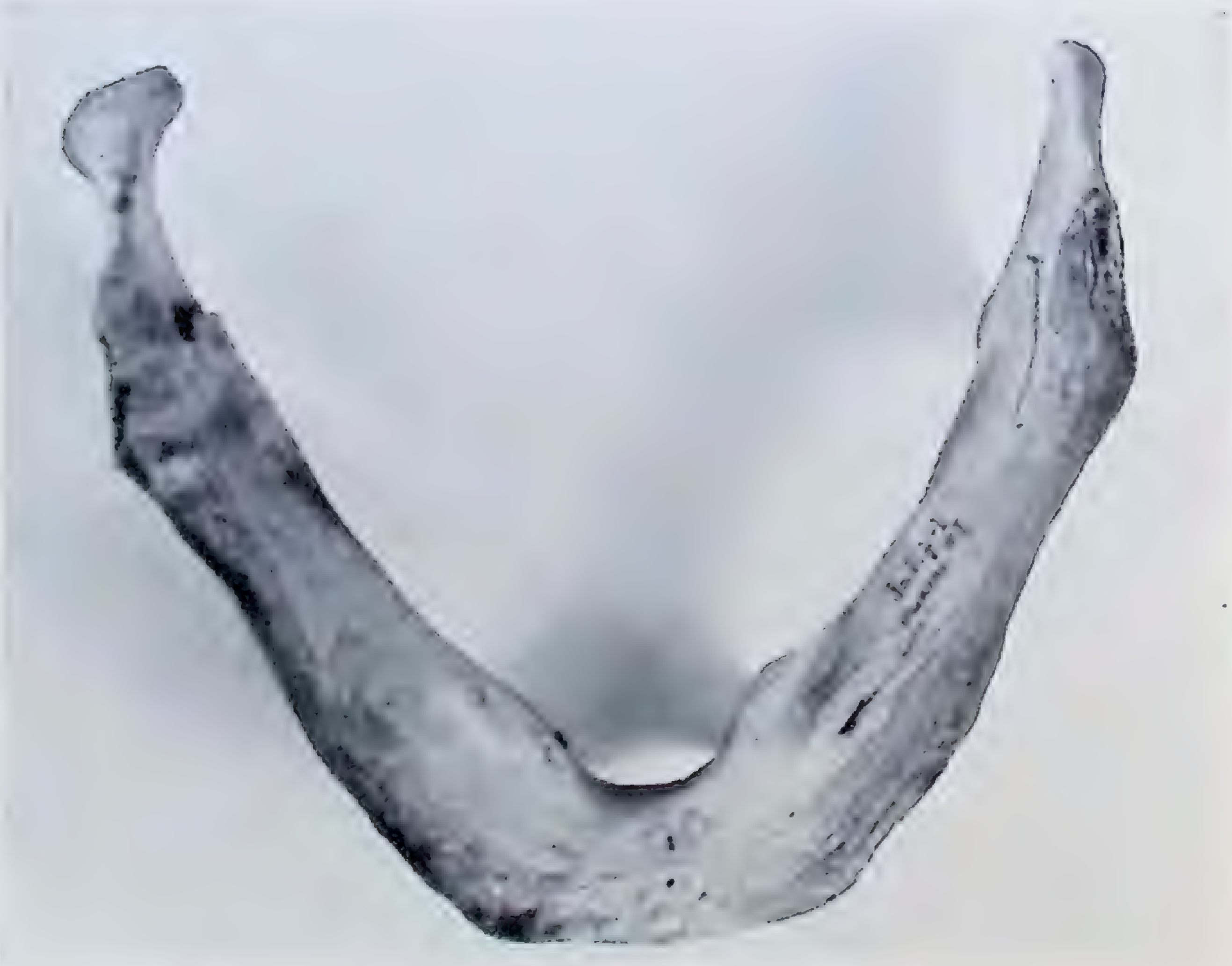


Fig. B. Mandible, Burial 1, Imaha site, inferior view.

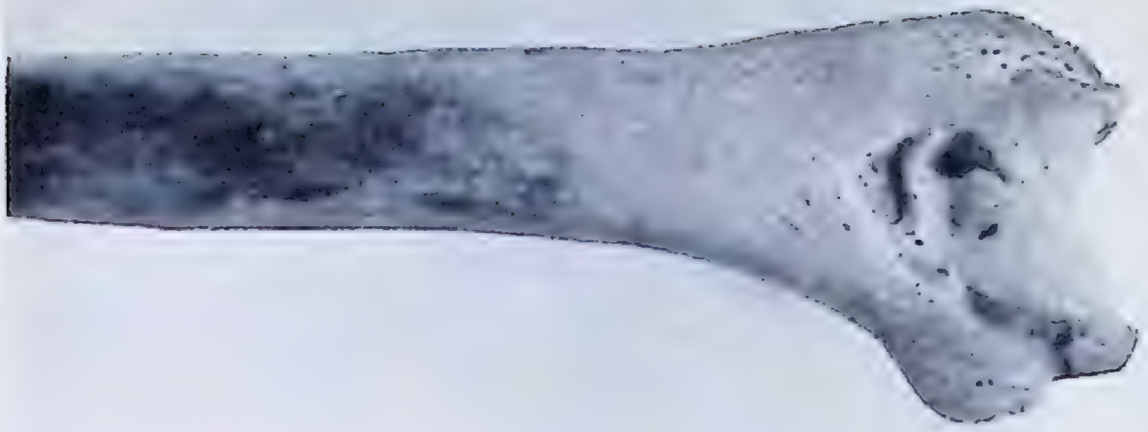


Fig. A. Distal end of humerus, posterior surface; Burial 1, Imaha site.

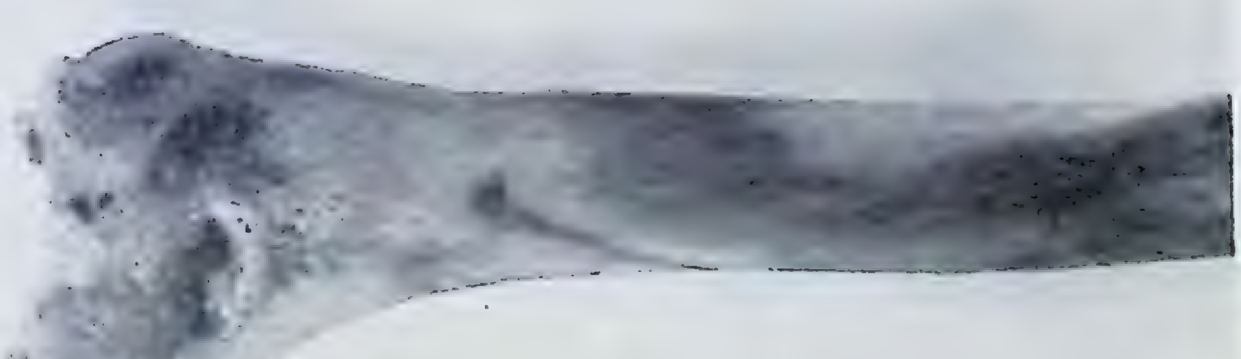


Fig. B. Distal end of humerus, anterior surface; Burial 1, Imaha site.

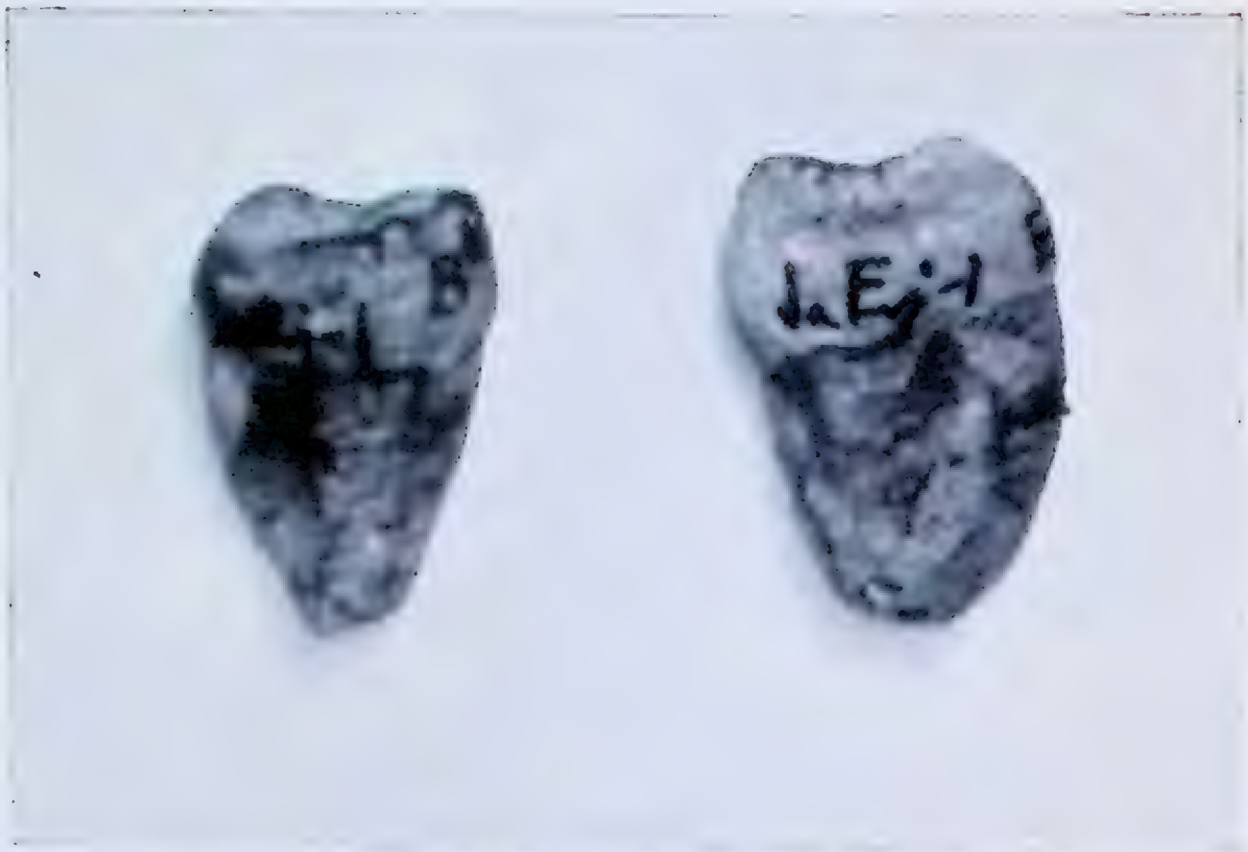


Fig. A. Unerupted maxillary third molars. The larger is the right molar; the smaller is the left molar. Burial 1, Imaha site.

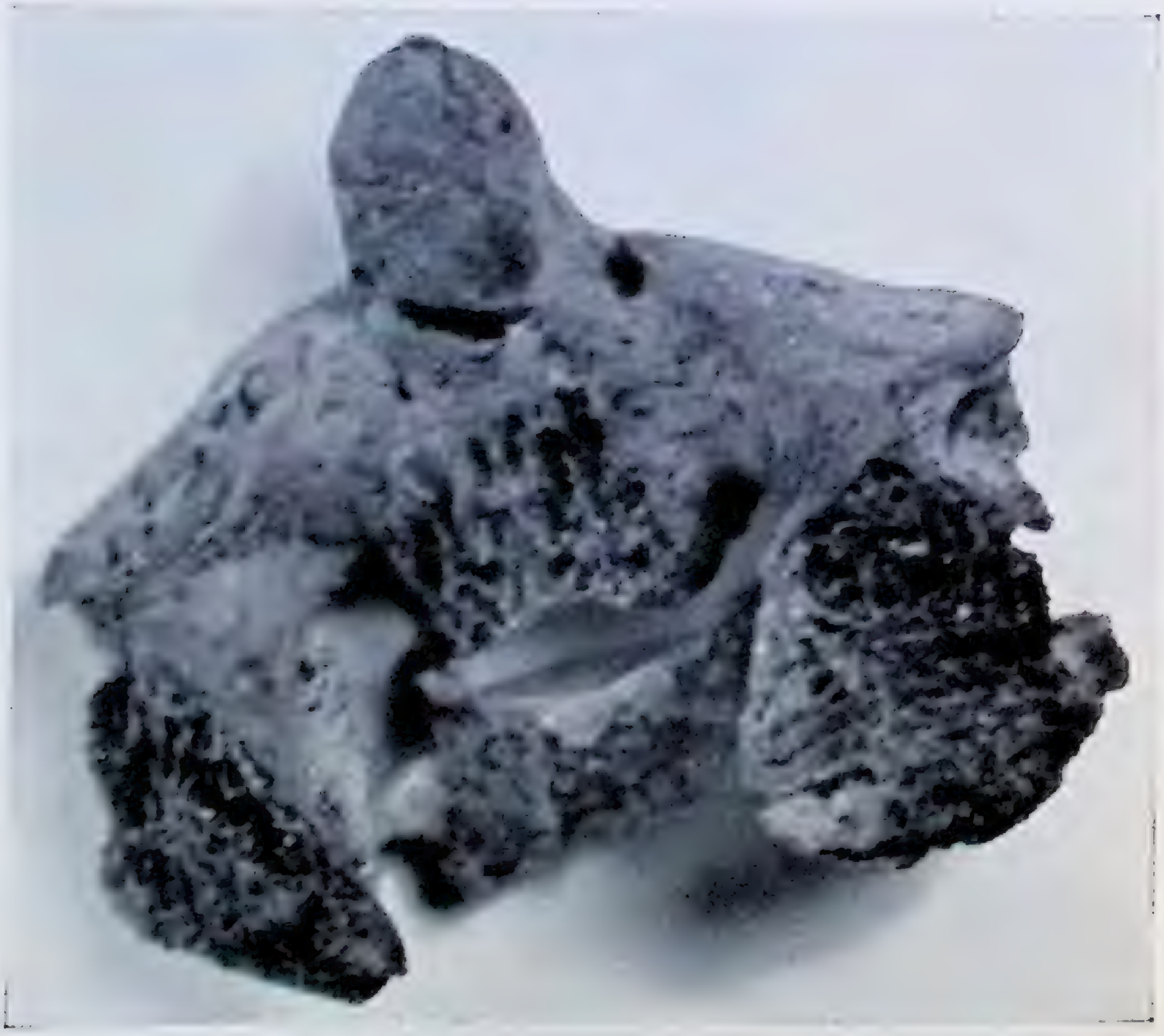


Fig. B. Fusion of first and second cervicle vertebrae. Burial 1, Imaha site.

THE LUCAS SITE, INVERHURON, ONTARIO

By Thomas E. Lee

ABSTRACT

This report deals with the broad time and space relationships of the two major components, Point Peninsula and Iroquoian, of an Indian site on the east shore of Lake Huron. The location is on old beaches close to the present shore, where a bay is formed by a sheltering point to the northwest.

Occasional surface collecting and trenching over a period of five years produced information bearing upon the subsistence patterns employed here, which suggests heavy reliance upon fishing. Scanty stratigraphic evidence merely indicates the pre-Iroquoian position of Point Peninsula. Some possibly related burials are briefly considered.

The relationships indicated are based very largely upon non-statistical ceramic comparisons. Single occupations of the site by each of the two cultures are improbable, but the principal Iroquoian connections are found in the Webb and related sites across Ontario, which are close to and probably slightly earlier than Lalonde.

The identification of several of the Point Peninsula sherd types suggests relationships with such widely separated Ontario sites as Kant, Frank Bay, Burley, and (to a lesser degree) Malcolm, fairly early in the Middle Point Peninsula sequence.

The distribution of Point Peninsula is shown to cover an enormous territory within Ontario and Quebec, ranging from Fort William, Ontario, on the west, to Kempt Lake, Quebec Province, on the east, and at least as far north as Lake Abitibi. It is presumed that the borders will be pushed much farther outward when further work is done or reported upon.

A clustering of sites in the vicinity of the mouth of the Saugeen River is considered significant in terms of probable movements from Manitoulin Island down the Bruce Peninsula, thence up the Saugeen to the Grand River and to more distant parts of the Province.

Continuity in development from Point Peninsula through the Owasco of New York to Iroquois, as urged by some investigators, is seen to have certain objections in terms of the information currently available, in spite of the supporting evidence advanced. From Ontario's Owasco times, however, a satisfactory continuity through Glen Meyer can be demonstrated. Specific tribal identities, on the other hand, cannot be pursued from the historic to very far back in time.

INTRODUCTION

This report is primarily concerned with certain Point Peninsula manifestations in Ontario. It is based upon several investigations of the wind-eroded Lucas Indian site, which took place principally in the spring and autumn of each year from 1950 to 1954. The results are combined with those from a number of archæological surveys conducted by the writer in Ontario from 1949 to 1957 (Lee, 1951 and 1952), when 58 Point Peninsula sites (plus nine Early Woodland sites) were examined. The practice of designating sites in terms of a few flint chips or a donated artifact has not been followed by the writer. Much more material should be found to justify site designation. Otherwise, a site might cease to exist, upon the transfer of two or three flint chips from the ground to one's pocket.

Field work in 1949 (Lee, 1951) along the north shore of Lake Erie established to my satisfaction the existence of cultural sequences ranging back some 5,000 years in that area. It was the concept of back-tracking on presumed or probable routes of Indian travel in search of ancestral sequences that led me northward in 1950 (Lee, 1952) into the Bruce Peninsula and ultimately to the discovery of the Sheguiandah (Lee, 1953) and Giant (Lee, 1954) sites.

A check was made of our National Museum files and of the Royal Ontario Museum files (courtesy of Mr. K. E. Kidd), which revealed a remarkable and startling paucity of information about the entire County of Bruce. At this date (May, 1958) I have recorded and examined 51 definite sites in addition to numerous scanty occurrences of materials in the Bruce Peninsula. To Messrs. F. Knechtel, D. Shutt, and F. Morton, I am deeply indebted for either showing me the sites or providing the clues leading to the discovery of more than half of them.

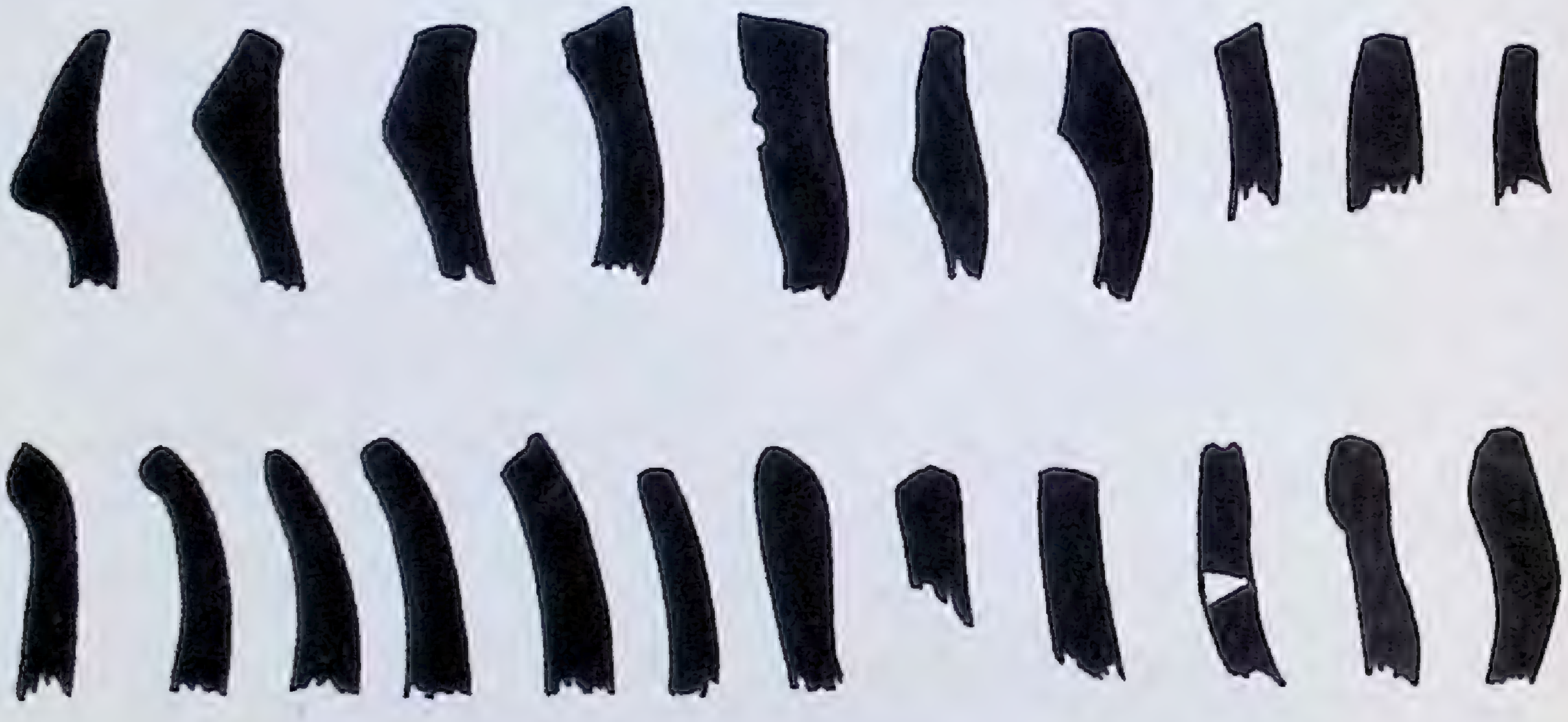


Figure 1. Rim cross-sections: top, Iroquoian; bottom, Point Peninsula.

On the evening of July 26, 1950, while making brief checks along the east shore of Lake Huron en route to Manitoulin Island, with the help of K.C.A. Dawson of Toronto, I found three sites at Inverhuron in less than an hour. These were on sand dunes and old beaches. The largest, the Fritz site (Lee, 1952, p. 69), littered with firestones, covered approximately four acres. A more extensive search was not possible at the time, but a plan to return for detailed work was strengthened next day when we saw the important collection of Mr. D. Shutt at Southampton, a few miles north of Inverhuron. (The entire collection was generously donated to the National Museum of Canada.)

On July 31, Mr. F. Knechtel was met in Hanover, and arrangements were made to see his collection. He was most generous in showing his materials and in discussing their sources. He made the collections over a period of several years without attracting the attention of more than a handful of trusted friends. He was fully aware of the destructive activities of curio-seekers and made every effort to protect his sites, a course which I endeavoured to adhere to by avoiding specific location descriptions in my survey reports (Emerson, 1958: 39).

On August 2, 1950, Mr. Knechtel and his nephew, W. Lucas, accompanied us to Inverhuron, where they showed us a remarkable series of sites in the dunes, including the three found by us in July. It was from here that some of the Knechtel collections had come, which provided us with a ready means of assessing the value of the sites.

We had been within 200 yards of an important site along the lake shore, which was later named the Lucas site (Lee, 1952, p. 70), in recognition of the earlier work of W. Lucas. Surface checks revealed traces of historic, Iroquoian, Point Peninsula, and possibly preceramic components. There were indications that Iroquoian and Point Peninsula components might overlap and provide stratigraphy. The collections described herein were accumulated on numerous occasions through the years. At times, I was assisted by K.C.A. Dawson, W. E. Taylor, B. Bennett, J. Wright, W. D. Bell, A. Metzger, W. Lucas, and F. Knechtel. To these and to others, but particularly to Mr. Knechtel, who, on numerous occasions, generously provided the hospitality of his cottage at Inverhuron, I extend my appreciation and thanks.

In 1956, Mr. W. Kenyon was sent by Mr. Kidd of the Royal Ontario Museum to evaluate the sites and later to dig them (Kenyon, 1958). The present report is based upon the incomplete evidence in National Museum files. Its purpose is to make available to the profession as a whole, certain results of my accumulated field observations.

I extend my appreciation and thanks to Dr. W. Mayer-Oakes, Mr. Vernon Leslie, and Mr. Frank Ridley, who have kindly read this paper and offered valuable suggestions for its improvement.

Location and Environment of the Lucas Site

This site, as it is known to the writer, occupies parts of lots 3 and 4, Lake Shore Rge., Bruce Tp., Bruce Co. (Figure 2), close to the shore of Lake Huron at the point where a small creek, the Little Sauble, bends sharply to flow southward 100 yards back of the shoreline and parallel to it. Cultural material is continuous almost to the mouth of the creek. Shelter from northwest winds is amply provided by Gunn Point, a prominent feature projecting southwestward into Lake Huron. Today, much of the area involved consists of an exposure of old beaches, at least 13 in number and roughly parallel to each other (Figure 3). They are clearly indicated by low ridges of beach pebbles and cobbles. Cultural material, occurring between 590 and 600 feet above sea-level, is found on the ridges, but it is evident from the presence of artifacts in overlying sand behind the exposed beaches and in small hummocks here and there, that the entire village site, when occupied, was on sand, which has since been removed in many places by wind action, thereby lowering artifacts to the level of older beaches. The steep and eroding sides of the hummocks reveal an occupation stratum above

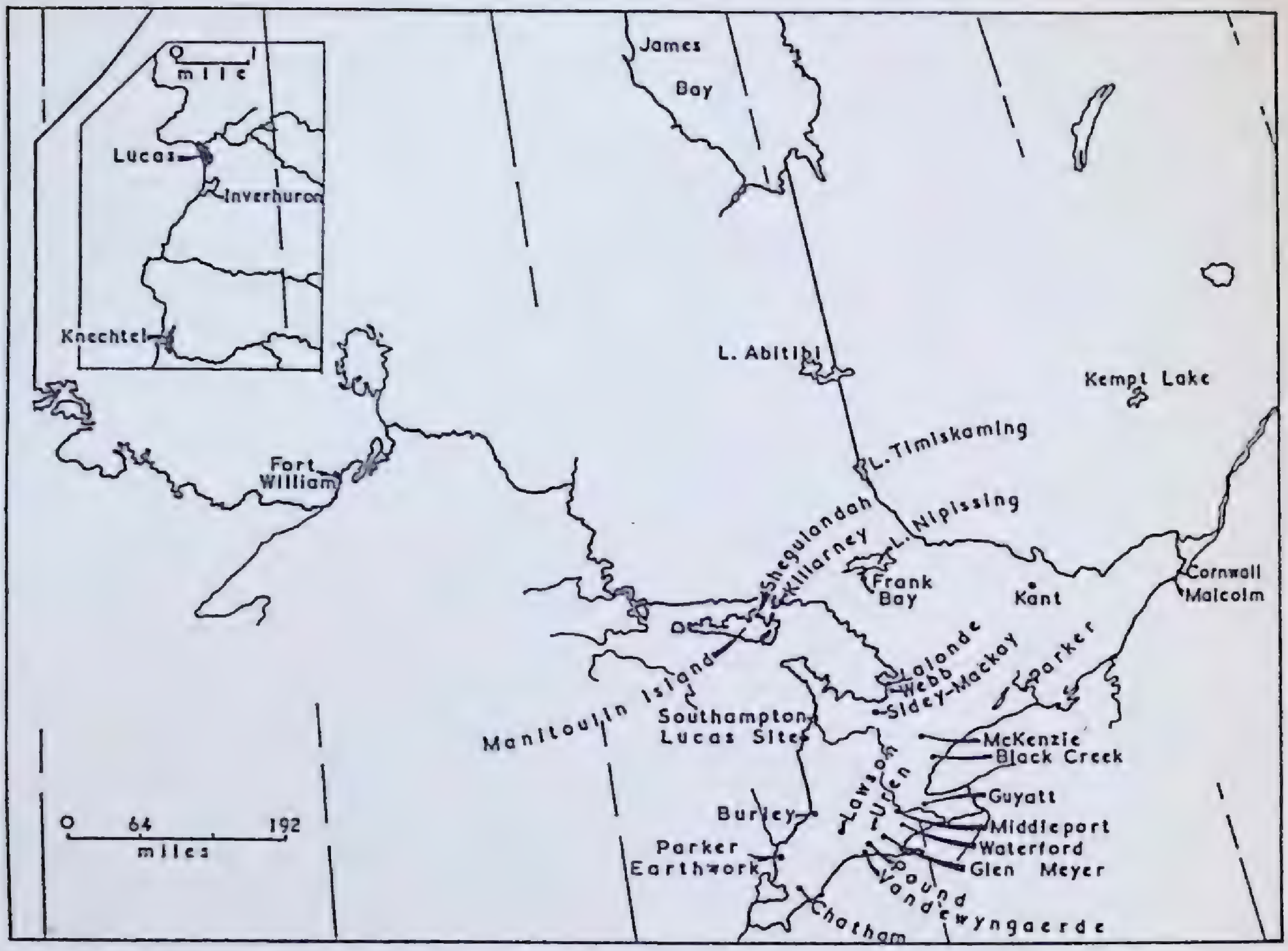


Figure 2. Map of parts of Ontario and Quebec, showing positions of the principal Point Peninsula and Iroquoian sites mentioned in this report.

the stony beaches, in turn covered by some feet of blow sand. Often the hummocks are crowned with ground junipers or with clumps of white cedars, perhaps representing the character of the original forest cover and corresponding to the adjacent cedar forest on the north, where, presumably, the Lucas site continues at some depth. The presence of European refuse in or on the same occupation stratum at two or three points shows, however, that at least some of the blow-sand overburden is fairly recent.

At least twelve sites, together with numerous minor exposures of cultural material, occur in the immediate vicinity, along either the abovementioned creek or the Lake Huron Shore. They can be assigned to Archaic, Point Peninsula, and Iroquoian cultures. Most of these are on sand, but at least two on heavy clay were discovered by the writer well back from the shoreline. An apparent association of sites, with a remarkable series of old beaches near by, offers some encouragement in the direction of dating particular cultural manifestations. Some sites are definitely ceramic; others present an older Archaic complex with certain Laurentian resemblances, although they are in many respects quite different from the New York or Eastern Ontario assemblages. An outstanding feature of most of the sites, belonging both to the ceramic and preceramic is, in my opinion, the amazing profusion of firestones so closely covering acres of ground that it was impossible not to step on them everywhere. Nothing comparable to

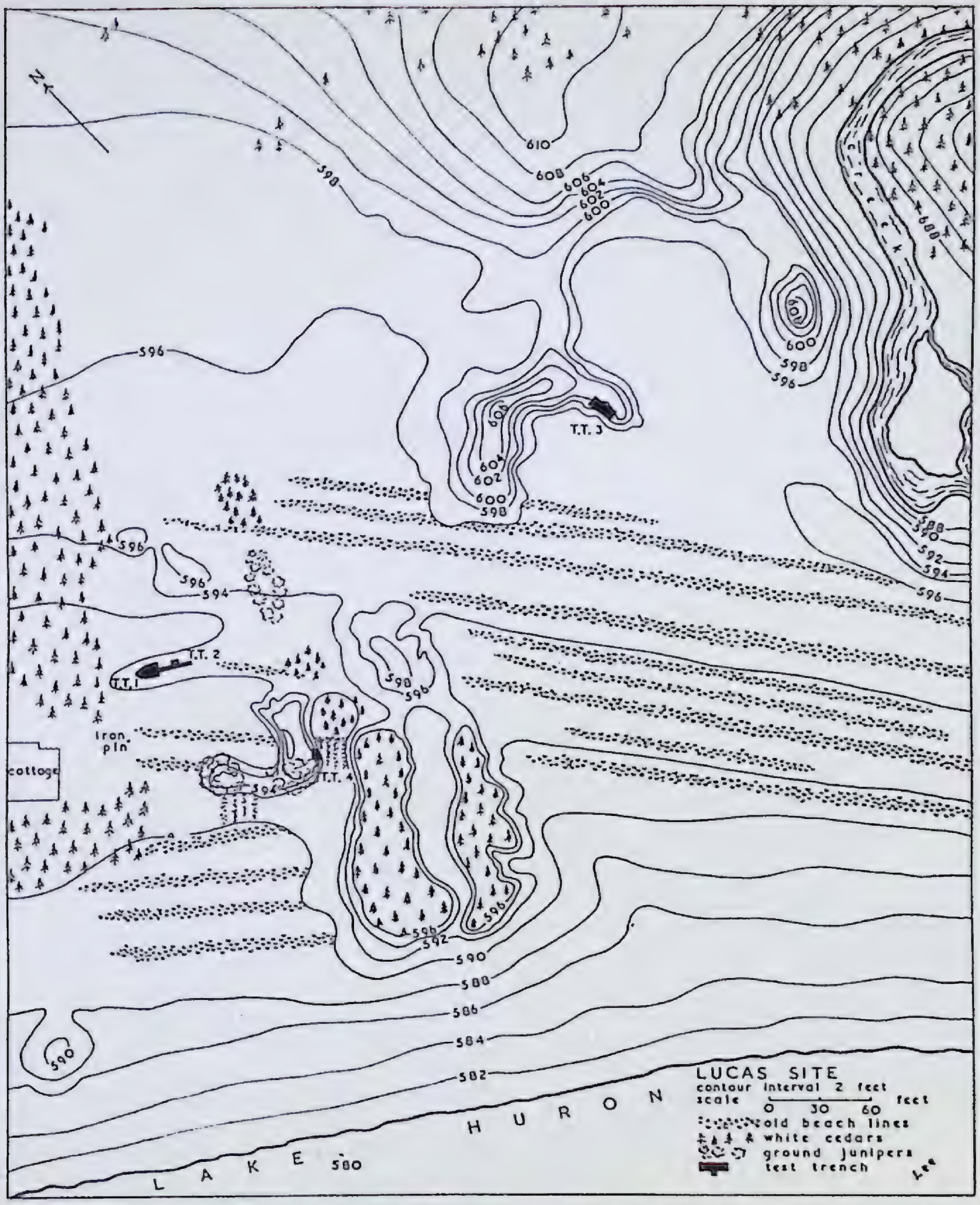


Figure 3. Sketch map of Lucas site. Elevations by hand level. Distances paced.

this, other than in the general area of Southampton southward to Pine River and along the south shore of Manitoulin Island, has been seen on the nearly four hundred Indian sites examined by the writer in Ontario.

Sites of different cultures overlap in places, and it is not unreasonable to expect that good stratigraphic sequences exist somewhere among the dunes of Inverhuron.

Excavations at the Lucas Site

Test Trench 1, September 1950. Iroquoian exclusively, all levels.

This trench, 8 by 14 feet, was opened along a low ridge or mound, some 10 to 12 inches high, where cultural material was eroding out of carbon-laden soil.

The ridge was planed off in 2-inch levels. Stripping was not feasible, since the mound shape resulted more from erosion than from accumulation.

A concentration of fire-cracked stones was found near the west end. No stratigraphy developed in the 6-inch culture-bearing layer. Testing to 18 inches produced only clean sand. Removal of the basal portion of the carbon-laden soil revealed an interesting pattern of dark areas (Plate II, fig. 16) clearly resulting from previous digging by someone who used a square-mouthed shovel which had reached down into the subsoil at intervals.

Materials recovered included two rim sherds, a decorated sherd and a neck sherd, five body sherds, four split sherds, a fragment of pipe bowl, and a fine celt (Plate II, fig. 9) with fish, mammal, or bird bones at all levels.

The presence of a square iron nail in the layer, plus definite shovel marks beneath it, proves disturbance.

Test Trench 2, September 1950. Iroquoian exclusively, all levels.

A trench 2 feet wide and 20 feet long was opened southeastward from TT1, continuing along a slight ridge. A general culture-bearing level no more than 6 inches thick was revealed under blow sand. From it were obtained a rim sherd, five body sherds, three split sherds, and some fish, mammal, and bird bones. Shovel marks were again noted at certain points in the subsoil, which bore a reddish to brownish discoloration, as from heat, to a depth of 15 inches.

Part of a circular feature was exposed in the subsoil. An extension of 4 feet was made to the north to encompass all of it, while a quarter-slice was cut to the centre of the feature from TT1 (Plate I B), revealing the layered contents and form of a pit. This was excavated and contoured at 2-inch intervals. It contained a mottling of grey and black soil, heavily sprinkled with charcoal specks, with occasional lenses or layers of clean sand, which must have trickled or washed into the pit at brief intervals when it was being filled. Conspicuously, square-mouthed shovel marks were present on two sides, breaking the even outline of the pit in its upper levels. Maximum depth of the pit was 23 inches from the base of the 6-inch culture-bearing stratum.

Within the pit were quantities of fish bones and a few mammal bones, bits of chert, five small body sherds, and eight split sherds. Two rims bearing Iroquoian designs were found near the bottom. An unusual concentration of 30 fire-cracked rocks was removed. Their presence suggests that this may have been used as a roasting pit as well as for refuse.

Test Trench 3, September 1950 and 1951. Iroquoian and Point Peninsula.

Near the most distant point from the lake shoreline where cultural material was visible on the surface, a trench 6 by 6 feet was opened in 1950. Both Iroquoian and Point Peninsula sherds were lying on the surface near by.

Removal of a considerable overburden of blow sand exposed a dark humus and ash layer, on the surface of which were square iron nails and bits of bone china among Iroquoian (4 cord-marked and 4 plain body sherds, 1 trailed sherd) and Point Peninsula (1 plain, 2 dentate-stamped, 4 thong-marked, and 2 trailed sherds) pottery. The upper part of the layer had been disturbed either by settler activities or by erosion. Similar mixing was found throughout the top 6 inches, which produced ten Iroquoian sherds (7 plain and 3 cord-marked body), ten Point Peninsula sherds (1 rim, vertically cord-marked; and 1 plain, 3 thong-marked, 3 trailed, and 2 split), an end scraper, five net sinkers, a core and chips, a stone axe fragment, and one square iron nail.

From 6 to 12 inches, materials were exclusively Point Peninsula. The 32 sherds from this zone show prominent coil breaks, with dentate stamping (15), light trailing (16), and interior channelling. Only one rim sherd was found. It combines oblique dentate stamping, horizontal trailing, and vertical thong-marking. Chert chips and a core were revealed, along with several fire-cracked stones.

A small celt (Plate II, fig. 8) and 13 Point Peninsula sherds (1 dentate-stamped, 12 trailed) were obtained from the 12- to 18-inch level.

If any cultural development within Point Peninsula is revealed in the small samples from the various levels in this trench, it is not apparent to the writer.

An extension of 5 feet to the southeast was made in 1951 with better results. Removal of from 14 to 21 inches of blow sand exposed a dark surface with four Point Peninsula sherds (2 dentate-stamped, 2 plain), two bones, and a square iron nail scattered about.

Only Point Peninsula materials were found at greater depth. Eight rim sherds (4 rocker-stamped, 2 plain with notched lips, 2 dentate-stamped) were found in the first 6 inches, along with 17 rocker-stamped, 17 dentate-stamped, 50 plain, and two trailed neck and body sherds. One net sinker and some bones and teeth of a beaver were also found. Further excavating to subsoil at 9 inches added 27 sherds (1 rim, plain with notched lip, and 9 dentate-stamped, 1 rocker-stamped, 15 plain, 1 trailed neck or body sherds). A shallow pit partly accounts for the increased quantities of sherds.

A further extension of 5 feet to the southeast, under 15 inches of blow sand, revealed a 5-inch culture-bearing stratum on clean white sand. In it were 97 Point Peninsula sherds (1 corded rim, Plate III, fig. 5, and 4 rocker-stamped, 3 dentate-stamped, 76 plain, 13 trailed neck and body sherds), several chert cores, a net sinker, a deer tooth, and two fragments of bone china. The latter again proves disturbance.

Test Trench 4, September 1951. Iroquoian exclusively.

A trench, 2½ by 6 feet, was dug into a dark layer on the east side of a hummock where wind had removed most of a deep blow-sand overburden. Surface collections from the spot included part of a flaring ringed pipe bowl. Another fragment of the same pipe was found within the trench (Plate V, fig. 1).

The deposits once lay over the now-exposed beach pebbles to the southeast, where bits of sherds and a paving of firestones were observed. Numerous test holes around the hummock were made. Six sherds (1 rim, 4 body, 1 split) and fish, bird, turtle, and mammal bones were obtained. Four fragments of bone china, Willow pattern, were in direct association.

Stratigraphy

No completely undisturbed situation was encountered. The evidence of TT3 shows only that the Iroquoian materials followed the Point Peninsula culture. Unfortunately, nothing was found to assist in distinguishing stages or sequences within the Point Peninsula. No cultural development was recognized in the one situation where pottery was present to any appreciable depth.

The trenching discussed above supported the surface indications that Point Peninsula peoples used that portion of the site lying well back from the present shoreline—perhaps because of relatively higher water-levels. The Iroquoian peoples used the forward portion of the site, overlapping the Point Peninsula area. However, European material, presumably the refuse of early settlers, is distributed over the entire site.

SUBSISTENCE PATTERNS ON THE LUCAS SITE

Although the evidence for a full understanding of the ways of life pertaining to the various occupancies of this site is scanty, clues to certain aspects of the problem are present both in the cultural material recovered and in the physical environment itself. Without going too far beyond the evidence, certain inferences may reasonably be drawn.

Agriculture

Although the principal reason for the selection of the Lucas site by various Indian groups must have been its proximity to the lake and fishing grounds, it is also probable that the sandy soil was used for the raising of tobacco. Certain other crops may have been grown here, but no carbonized plant remains were found in the excavations. Mixed farming is carried on now, adjacent to the blow-sand area on which many Indian sites have been found.

Hunting

Little was found to suggest that hunting formed any major part of the economy in any period. A few bones of deer, small mammals, birds, and a turtle were found. Only the remains of a beaver were clearly associated with Point Peninsula. More extensive excavating might greatly change the picture, of course.

A few projectile points attributable to both Point Peninsula and Iroquoian periods have come from the site, but only the tip of one was found by us. No doubt, surface collecting by persons unknown has removed many of these conspicuous and attractive forms. Scrapers were not numerous; only three of the usual "hide scrapers" were found by us. A much larger scraper form (Plate II, fig. 4) may have been used in the dressing of hides. Its rough edges further suggest that some of the crude "choppers" may have been used in this connection.

Tentative and unsatisfactory identifications of the bones obtained from the trenches were made by the writer. These include four deer, 28 small mammal (including ten beaver), and four bird bones; also four sections of turtle carapace, identified further by Sherman Bleakney, formerly of the Natural History Branch, National Museum of Canada, as that of the Painted Turtle. In addition, there were three rodent teeth and 13 beaver teeth, also one deer tooth and an unidentified small mammal tooth.

Fishing

The evidence for fishing is considerably stronger, as would be expected from the lakeshore environment behind a sheltering point. Fish bones were found in all levels and features, in trenches 1, 2, and 4, which are Iroquoian. Trench 3, which contained mainly Point Peninsula, yielded beaver bones, but no fish. A few otoliths of the drumfish were found on the surface. Fresh-water clam shells are remarkably scarce; only one was obtained from the trenches.

Other indications of fishing were seen in the occurrence of numerous net sinkers. These are notched for tying to the bases of nets in order to weight the nets and assist in maintaining their vertical position in the water. All the net sinkers retained or found by us either were surface finds or were from deposits containing at least some Iroquoian pottery. Kenyon (1958) reports that they were absent from Iroquoian strata.

From the trenches and features, 289 fish bones were obtained. No scales were observed, but Kenyon (1958: 47) found them in tremendous quantities. Numerous fish bones occurred on the surface but may pertain to fairly recent European activities as well as to Indians or settlers.

Wood, Bone, and Leather-working

The site has yielded a few end scrapers and flake side scrapers, which may have been used in any or all of these activities. The products have not been found, and uncertainty must necessarily accompany any suggestions concerning specific use in most cases. It is probable that much of the cutting of wood, bone, or leather was accomplished by the use of simple flakes of chert. When flakes are not modified, such use is often difficult to prove. One small specimen with modified edges for use as a scraper also has a graver point (Plate V, fig. 8).

Certain tools, however, seem more closely associated with the cutting and shaping of wood. A number of axes and celts or fragments of these were found. One from an Iroquoian trench (Plate II, fig. 9) is very sharp and quite capable of slicing into hardwood. Others are relatively rough and better suited to splitting logs. One (Plate II, fig. 13) is much blunted and must have been used on some hard material such as bone or stone.

Food Preparation

The presence of carbonized cooking sediments on the inner surfaces of both Iroquoian and Point Peninsula sherds indicates that at least some of the vessels were used for the preparation of food. The method of heating and boiling is probably revealed in the quantities of firestones so conspicuous on this and other wind-eroded sites in the area. The stones were probably heated and dropped into the pots. Such firestones, along with fire-cracked rocks, were encountered in trenching. Concentrations of the latter in pits suggest that roasting by means of heated stones was in use.

Further evidence in this direction is seen in the occurrence of quantities of fish bones and fine charcoal in one Iroquoian feature. The surrounding beach sand, however, has not assumed the burned appearance so common in certain other soils.

Numerous hammerstones occur on the site. Several seem much too large and heavy for such stone-working activities as were carried on here and in all probability were used in cracking open the larger animal bones to obtain the marrow. Any of the numerous boulders or cobbles along the beach would have served very well as an anvil.

Refuse Disposal

It would have been a simple matter to toss unwanted materials into the adjacent lake or creek. Perhaps this was done to some extent, but here, as has frequently been observed elsewhere by the writer, quite a lot of such refuse was put into a carefully dug pit or into the camp-fire. What may have been a roasting pit, as in one case, ended up full of discarded material. In marked contrast, European material—particularly of the tin can and bottle era—had been strewn over most of the site or buried barely below the surface, where it is quickly exposed again by erosion or animals.

Burial Customs

No graves of any period were encountered in the trenches or exposed by erosion on the Lucas site. However, certain burials were removed only a short distance from the site and may well pertain to the Point Peninsula component of it. All show some employment of red ochre. The first of these (Lee, 1952: 69) was excavated in 1950. It was a much scattered and fragmentary find in a wind-eroded depression. The ochre was confined to a circular area 6 inches in diameter and 16 inches deep, resembling a post mould, situated near the skull. A partial cremation is indicated by the charred condition of a cranial bone and the presence of ash and charcoal concentrations. The vague outline of a pit about 30 inches by 60 inches, long axis north-south, was detected at 14 inches below the surface but could not be traced much below this point.

The second burial was reported to me by F. Knechtel and J. Wright in 1953 as a surface exposure in a sand blow-out. The burial was excavated in May, 1953, under my direction, and almost all the materials from the burial are in the collections of the National Museum of Canada. The bones appeared at a depth of 18 inches below an old humus line on the adjacent bank. A semicircular pit containing part of the skeleton of a child was revealed by excavation. The leg and pelvic bones were missing, as were parts of the lower arms. The child had been placed on its left side, bent to fit the curvature of the pit in the southwest quarter, with head to the northwest and face turned northeast and slightly downward. The arms were extended along the sides. Two extra scapulae (not yet identified) were found in approximately proper position, though two animal paws with claws (not identified) were placed in front of the face. In the neck region were 124 tiny shell (disc) beads. Five were left with F. Knechtel, who later found another on the surface. Bright red ochre-stained sand, to the amount of a bushel or more, surrounded and underlay the bones, which were also heavily stained with ochre.

The third burial, included in those mentioned by Wright (1956:194), was reported to me by him as a surface exposure in a wind-eroded area only 34 yards from the first skeletal discovery. It was taken out under my direction in September, 1953, with the assistance of W. and L. Lucas, J. Peace, and J. Wright. The skeleton appeared to be that of an adult female, placed in a bark-lined semicircular pit, tightly flexed, with back bent to fit the curvature of the pit. It lay on its right side, with the head to the northeast. The right hand was clenched at the base of the neck. The left hand was either severed or turned sharply back upon the arm. The major long bones were broken, whether intentionally or from other causes is not known. The sand under the bones to the depth of the bark lining and around the skeleton was deeply stained, brownish rather than red, particularly in the pelvic region. No grave goods were found other than one small potsherd, which was probably unintentionally included. At least six copper awls, square in cross-section, have been found on the surface within 70 feet of the grave.

The fourth burial again involves the use of ochre but differs in certain respects (Wright, 1956: 194). It was discovered by F. Knechtel in an exploratory pit, which was dug to determine the nature of a mound that seemed significantly different in form from the nearby dunes. Much-fragmented bones were submitted by him for examination in 1950 and were identified as human ones by the writer. Work in 1956 by Knechtel and Wright established the general artificial nature of the mound. Wright (1956) reports "a diagnostic Laurentian chopper" in a burial within the mound.

Cultural Material from the Lucas Site

(Combined Surface and Trenches)

Pottery

The principal material obtained from the Lucas site, in terms both of quantity and diagnostic value, is pottery. It provides, of course, an easy means of separating Iroquoian assemblages from Point Peninsula. Unfortunately, no clear development within each assemblage has been determined from the evidence here, although it is probable that there were several intermittent occupations by each group. We are in full agreement with Dr. E. S. Carpenter (1953) that pottery should not be considered to the exclusion of other lines of evidence, but at this site we are forced to lean very heavily upon it.

Separation of the pottery into Iroquoian and Point Peninsula groups is made easy by the marked differences in tempering materials, in addition to certain other conspicuous features, such as decoration, surface treatment, rim forms, and decorative techniques. For a considerable body of the material, the presence of coil breaks and deep interior channelling serves further to identify the Point Peninsula. Whether a third component is very weakly present is an undetermined point. We shall deal first with the Iroquoian elements.

Iroquoian (Ancestral Iroquois) (Plate IV)

Major characteristics: Collars, Iroquoian designs and techniques, and sand tempering.

Material: 14 rim sherds, 34 decorated, 298 body (51 split).

Paste:

Temper: Light- to medium-coloured sand (89.5% of sherds); medium grit (6.1%); mixed sand and grit (4.4%).

Very fine grained (.5 mm) to medium (6.5 mm). Under 3 mm in 82 per cent of sherds.

Sparse (4.8% of sherds) to abundant (52%).

Texture: Fine to medium.

Hardness: (Mohs scale) 3.5 (5.5% of sherds) to 6 (6.7%), with 33.5 per cent of sherds at 4.5.

Colour: Light to medium brown and orange-brown, with small amounts of orange, grey, and dark brown.

Surface finish: Smooth (87%); cord-marked (12%); grooved paddle (1%).

Decoration: Trailing (54% of decorated sherds) or punctates (23%), either singly or in combination (23%). These, in our collections, occur in basic, interrupted, open triangle, complex neck-decorated, and punctate decorated designs (after Emerson 1956 a, Figure 5: a, b,k, and l; Figure 6: n; Figure 7A: d; and Figure 7B: i, m). Five neck and two collar sherds are entirely plain and are not included in totals.

Form: Ten different rim cross-sections (Figure 1). Represented are well-defined channelled and unchannelled collars; well-developed overhanging channelled collars (including cornices); high collars; olla and expanded lip forms (after Emerson, 1956 a: 5). Thinned lip forms are also present.

Several castellations have been found. Included are variations of the Classic Early, the High Collared Nubbin, the Undulating (after Emerson 1955a), and various Truncated (rising to a flat area instead of a point) forms.

The complete vessel forms are not known from this site. However, nothing was found to suggest that anything unusual should be expected. Body sherd thickness ranges from 3.5 to 13 mm, with 89 per cent lying between 5 mm and 9.5 mm.

Occurrence (*see* Figure 2):

Identification of specific Iroquoian pottery or sherd types is not undertaken here, pending further study of the bases for several of the classifications already appearing in the literature. However, there are strong resemblances to some of the pottery from numerous Iroquoian sites in Ontario, including Middleport (Wintemberg, 1948); Lawson (Wintemberg, 1939); Sidey-Mackay (Wintemberg, 1946); Pound, Downsview, Black Creek, McKenzie, and Hardrock (Emerson, 1955a:13); Fallis (Ridley, 1952); Frank Bay (Ridley, 1954); Webb (Harper, 1952); Quackenbush (Sweetman, 1955); Boyd (Sweetman, 1957); and Parker Earthwork (Lee, 1958b). Certainly some of these sites were not contemporary.

Occurrence (*see* Figure 2):—*Concluded.*

This may mean either re-occupation of the Lucas site by Iroquoian peoples or relatively long histories for the particular styles of pottery in our collections from that site. Some of the elements of decoration or form appear of course in other site assemblages, both early and late. Quite similar Iroquoian assemblages of pottery are found on several sites in the Inverhuron area.

Point Peninsula (Plate III)

Major characteristics: Collarless rims; pronounced dentate, rocker stamped, crossed trails; coil breaks; very coarse grit temper, interior channelling (Plate III, fig. 8).

Material: 18 rim, 197 decorated, 205 plain, 14 cord-marked, 16 thong-marked sherds, and a grooved paddle. Forty-eight sherds are split.

Paste:

Temper: Medium-coloured grit (75.6% of sherds) and dark grit (24.4%). Fine grained (3 mm) to very coarse (13 mm). Maximum 6 mm in 54 per cent of sherds, between 6 mm and 9.5 mm in 32 per cent, and between 9.5 mm and 13 mm in 14 per cent. Sparse (.8% of sherds) to abundant (74.4%).

Texture: Medium to coarse.

Hardness: 3 (2.8% of sherds) to 5.5 (3.6%), with 54.5 per cent at 3.5. Sherds harder than 3.5 are predominantly surface finds.

Colour: Light to dark brown and orange-brown to orange.

Surface finish: Smooth (87%); cord-marked (5.9%); thong-marked (6.7%); grooved paddle (.4%).

Decoration: Considerable variation occurs, with crisscross trailing (44.2%); dentate stamp (36.9%); rocker stamp (14.5%); punctates (4.4%).

Most of the rocker stamping is simple, but the dentate form does occur. In the dentate stamp group, almost half show some dragging action or slight smoothing afterward. Trailing, rather than incising, is present and appears on more than half of the trailed sherds in a crossed manner which produces rhombic or rhomboidal shapes. It seems probable that a good part of the remaining trailed sherds are from the same vessels but are too small to reveal the complete pattern.

Form: Twelve different rim cross-sections (Figure 1). Thinned, thickened, and parallel-sided forms occur. Rims range from mildly incurving to slightly everted; necks are mildly constricted or straight; lips are rounded, flattened, or nearly pointed, or sometimes tightly scalloped. In all probability the bodies were slightly elongated, with sub-conoidal bases, not unlike the forms of three vessels from the nearby Knechtel site, which were excavated by B. Lee and the writer and are on display in the splendid museum at nearby Southampton. Body sherd thickness ranges from 6.5 mm to 16 mm, with 72.2 per cent at 9.5 mm, 21.8 per cent at 13 mm.

Occurrence (*see* Figure 2): Among the sherd types that can be recognized by their reasonably close resemblance to published New York types are Vinette Dentate, Vinette Complex Dentate, Point Peninsula Rocker-Stamped, Point Peninsula Plain, and variations of Point Peninsula Corded.

Aside from occurrences in New York and adjacent states, certain portions of the Point Peninsula pottery assemblages are widespread across Ontario, at least as far west as Fort William (Lee, 1958c) and as far north as Lake Abitibi (Ridley, 1956). Vinette Dentate or variations of it are conspicuous along the north shore of Lake Erie at least as far west as Port Stanley, at Port Franks on Lake Huron, along the Ottawa Valley from Montreal to Pembroke, on Manitoulin Island, and in the Pine River – Inverhuron – Southampton – Red Bay areas of Bruce County. Rocker stamping is almost equally widespread, while Complex Dentate shows up at least as far north as Lake Abitibi (Ridley 1956).

Miscellaneous

Only one sherd (Plate IV, fig. 9) diverges sufficiently from the Iroquoian and Point Peninsula materials to attract attention. Unfortunately it is a surface find.

It includes a portion of the shoulder and neck of a small vessel. The neck is plain, but four parallel incised lines drop vertically from the shoulder, which is otherwise plain. The near-absence of incising (as distinct from trailing) in our collections makes it all the more remarkable. The tempering is light-coloured sand, suggesting some relationship with the Iroquoian component. It is vaguely reminiscent of Oneota but is much more likely to be Iroquoian of the Webb-Middleport level (Ridley 1957: 34), although western traits such as the grooved maul have been found both in the Bruce Peninsula and on Manitoulin Island. It may be a toy pot.

Pipes

Only six pipe fragments (one stem, five bowls) were found. All but one are Iroquoian. The exception (Plate V, fig. 2) resembles Owasco (Kidd, 1954; Figure 14:1,2), with its arrangement of tiny punctates, but the shape falls more readily into the Iroquoian series of Ontario.

Two fragments (Plate V, fig. 1) form part of a flaring ringed bowl, with a single row of punctates below the rings. It is apparently identical with bowls from the Webb stratum of the Frank Bay site (Ridley, 1954; Figure 23) and from Webb (Harper 1952, Figure 5:e). The rim diameter is 54 mm. Another bowl fragment is from a plain pipe of similar shape.

Stone Artifacts

Ground Stone:

Specimens in our collections which show grinding or polishing are confined to axes and celts or fragments of these. One (Plate II, fig. 9) is ground over all surfaces. It is a celt from an Iroquoian pit. Its cutting edge is undamaged and easily bites into hardwood. Two small celts (Plate II, fig. 7, 8) show some grinding,

Ground Stone:—*Concluded*

but advantage was taken of natural surfaces. Plate II, fig. 8 is from a Point Peninsula association in TT3, from 12 to 18 inches depth. Grinding accounts for the surfaces of two axe fragments (Plate II, fig. 6, 13). The blade of one is much blunted from extensive contact with some hard material. Another blade portion is chipped out of slate but shows some polish, particularly along one edge (Plate II, fig. 10).

One axe fragment (Plate II, fig. 12) shows no trace of grinding, but it seems probable that it is unfinished. One face is chipped; the other is evidently a natural surface, resulting from beach action.

Chipped Stone:

Projectile points: Only the tip of a point (Plate V, fig. 7) is included in our collections from the Lucas site. However, points found on nearby and related sites suggest that corner- and side-notched points may be expected for the Point Peninsula component. Collector activity from the early days of settlement doubtless accounts for their scarcity in this exposed place.

Knives: The base of one knife-like biface (Plate V, fig. 10) was found on the surface. It is made from quartzite, probably obtained from beach cobbles right at the site.

Scrapers: Five scrapers were found on the surface or in the plow zone. Two are end scrapers (Plate V, fig. 11, 12). Two are flakes, each modified to give two scraping edges; one (Plate V, fig. 8) has, in addition, a fine graver point. A much larger scraping tool (Plate II, fig. 4) is made from quartzite.

Choppers: Roughly chipped objects, usually of slate, dense basic rocks, or fine-grained opaque quartzite occur on this and neighbouring sites, both Point Peninsula and preceramic. Evidence at the Lucas site is insufficient for cultural separation. Possibly some of the forms included with axes are of this category. An unusually small example is seen in Plate II, fig. 5.

Hammers: Many hammerstones were found at the Lucas site. Seven were retained as examples. They are usually 4 or 5 inches long. A few are granitic, but the favoured type was a remarkably heavy, fine-grained, dark rock of igneous origin, evidently obtained from the adjacent shoreline. Some show use as anvils, indicated by the presence of pits on one or both sides (Plate II, fig. 14). End-pounding is characteristic, but edges were often used instead. One (Plate II, fig. 11) appears to have been used in a club-like fashion, since only the edges toward the smaller end show evidence of pounding.

Net Sinkers: Numerous notched flat pebbles have been found here. Limestone was the favoured rock, but sandstone also served. Those retained for our collections range from 57 to 102 mm long, 38 to 75 mm wide, and 6 to 18 mm thick.

A remarkable feature of the sinkers is that nearly all are notched on the ends (Plate II, fig. 3), quite unlike sinkers from other areas of Ontario within our experience, such as the prolific

Chipped Stone:—*Concluded*

Sinker Site of Elgin County (Lee, 1952: 65). All the net sinkers in our collections were found on the wind-eroded surface or in the obviously disturbed upper levels of the trenches. This might suggest Iroquoian connections, but some contrary evidence is available on other sites and from the work of Kenyon (1958).

Chips and Cores: Samples only were retained for comparisons and for eventual use in the problem of chert origins. Varieties obtained include mauve (not the Port Franks type), white through dark grey, and pinkish. The greys predominate. Milky quartz and quartzite are present in small quantities.

The immediate source for much of the material is easily determined, thanks to the presence of the former surface or weathered rind on many specimens. These show clearly that beach pebbles were used extensively. Even the quartzite was obtained from beach cobbles. The relatively scarce nodule surfaces of chert specimens suggest an origin for part of the material, however, in the limestone formations of Bruce County to the north.

European Items

Scattered over the wind-eroded sections of the site are bits of china and pieces of iron, including square nails. Little attention has been given to them, since they may represent several periods, including the present day. A twisted section of an old gun barrel was found on the surface. From the upper and disturbed levels of trenches we have obtained a few square nails and some bits of china, evidently of the Willow pattern.

One item of some interest, an iron fish hook, is illustrated in Plate V, fig. 4. It is unusual in that the end of the shank is flattened instead of bent to form an eye. On one surface of the flat area are raised elements forming the number "13" (Plate V, fig. 5). Attachment was accomplished by wrapping cord around the shank, evidence of which is plainly visible in the illustration. The writer, whose early years were spent in a fishing port on the north shore of Lake Erie, is unfamiliar with hooks of this type, other than from this site and from seventeenth century historic sites, where hand-wrought hooks with flattened ends have been found. Similar hooks are said to be in use now in the cod-fishing industry of the Maritimes.

TIME AND SPACE RELATIONSHIPS

A favoured approach to the problem of relating a site to others is the analysis of pottery fragments and the comparison of the types identified or determined. This procedure involves "the assumption that sites producing similar pottery types were probably contemporaneous, or nearly so" (Emerson, 1955b: 51). The seriation of the ceramic materials from a number of apparently related sites, starting with the historic, is concerned with a concept of unilinear evolution, together with the further assumption that, as noted by Dr. James A. Ford (Carpenter, 1953: 74), "a culture changes gradually and constantly." Thus a prehistoric site most nearly like the earliest historic site is assumed to be ancestral to it. All the sites are arranged in a sequence in which the presumably older sites become progressively less like the historic and prehistoric sites first considered. "Where stratigraphic or other data are lacking, the seriation method can, within very broad limits, give an approximate chronology. But the assumptions which it makes and the errors to which it is susceptible are very great" (Carpenter, 1953: 75). So appealing is this method, with its results in graphic form, that it is likely to outweigh or otherwise obscure other considerations. Yet, as Carpenter (1953: 74) makes abundantly clear, this method, as employed by MacNeish (1952) and some others in Ontario, can achieve only a seemingly chronological arrangement of sites, because they establish the rule by starting with the rule and interpret the evidence accordingly.

If culture changed gradually and at a uniform rate from site to site across the vast spread of Ontario, the results might very well portray the true sequence of events. In my opinion, it is highly improbable that culture did develop here in this manner or that anything more than a very general and approximate positioning of sites is indicated. The value of this approach is obvious, in the absence of pertinent stratigraphic evidence, but a note of caution is warranted, in view of the manner in which seriations have been handled in the literature of this area.

Carpenter (1953: 75–6) has challenged the practice of determining tribal affiliation and general temporal position with "80 to 150 sherds," as well as the assumption that large amounts of one or two pottery types on sites which are separated by several hundreds of miles is indicative of contemporaneity. In his view, as interpreted by the writer, evidence such as this provides us with only one more clue, which must be kept in its proper relationship to a number of other clues usually present on a given site, all of which clues may or may not point in one direction; that is, pottery should not be considered to the exclusion or near-exclusion of other lines of evidence, nor should it be unduly emphasized.

At the Lucas site, a number of considerations, including the small size of samples from each component, the uncompleted trenching plans, the necessity of leaning heavily upon surface finds, and the rather obvious weighting of the evidence in particular directions through the selection of trenching positions, lead the writer to believe that statistical analysis for comparative purposes can have but little value here. Instead, it seems preferable in this case to seek whatever clues there may be to time and space relationships for both the Iroquoian and Point Peninsula components, in the presence (but not absence) of certain traits. Whether an older and preceramic element is present is, on present evidence, an unsettled question. In any case, it seems unnecessary at the moment to assume the presence of such a component, since the few items pointing somewhat in that direction may very well belong instead with the Point Peninsula component, a question best answered by further excavations.

IROQUOIAN

At one time (Lee, 1952: 70) I held the opinion that the Iroquoian component of the Lucas site represented an occupation by the Petun peoples, who might reasonably have been there, in terms of certain historic information. Points of similarity had been observed when comparing Lucas artifacts with those from certain sites in the supposed Neutral area of Ontario. These materials were thought to be quite late in the Iroquois sequences, with the assumption that the Lawson (and numerous sites apparently related) and Southwold sites represented a time just within or barely prior to the historic period of southwestern Ontario. Such a concept had grown out of a long interest and experience in the archæological manifestations in the central portions of a belt along the north shore of Lake Erie. In later times, a much broader sampling of Ontario materials in the course of general survey work brought me to the conclusion that the Neutrals were already east of the Grand River by historic times (Lee, 1956: 187). Numerous discussions and the exchange of information with Mr. Frank Ridley of Toronto convinced me that he was fully correct in his view that certain sites in the presumed Neutral area were part of a very extensive regional picture, rather than of a tribal one, although Griffin (1943: 369) had written that Wintemberg was probably correct in his consideration that the Uren site represented an early prehistoric Neutral group. Finally, the appearance of Emerson's interpretations and sequence (1956a: 34) suggested to me that the upper or later portion of the particular cultural development leading to the historic Neutral and certain other groups was missing or undiscovered in the area west of the Grand River. The answers to this puzzle, as suggested by the writer in an unpublished manuscript, probably lie to the west in Essex County.

In consideration of the above circumstances, the entire sequence, formerly thought to represent the Neutral development into the historic period, has been moved back in time and now coincides, I believe, with the findings of F. Ridley, P. Sweetman, and others. The Lucas site, which falls most readily into the Middleport – Webb – Lalonde sequence, cannot represent a Petun occupation, because it is much too early in time and, in fact, dips well back into the regional developments postulated and demonstrated by Ridley.

While keeping in mind the sobering thought of Carpenter's (1953: 75) warning that "there is no evidence that ceramic traditions were dominant themes in Iroquois culture or that they were particularly sensitive indices of that society's history," together with the deep conviction that many of the sites such as the Lawson, so frequently used to represent a single moment in time, are in reality stratified as the result of repeated or intermittent occupation over a long period of time, we turn to an examination of the time and space clues provided at the Lucas site. For reasons already stated, but primarily because of the site's exposure to the eyes of anyone interested in picking up an arrowpoint or other attractive item since the time of the earliest settler, we find most of our clues in the ceramics of both Indian components.

In terms of designs or rim sherds, somewhat generalized, the nearest parallels are seen (Figure 2) at the Webb site, the Guyatt site near Hamilton (Bell, n.d.), the Lalonde site (and in the Webb and Lalonde strata of the Frank Bay site), and, in the case of two rather unusual designs, in the Ontario Iroquoian component at the Parker Earthwork site. Rim cross-sections, though usually not identical from site to site with given designs, are not too divergent. Castellations include forms most nearly like Emerson's Classic Early, which ranges at least from Uren to Lawson; Undulating (presumably multiple); and a truncated form bearing some slight resemblance to the High Collared Nubbin, which Emerson (1955a: 3) places in the "early and intermediate" periods.

In Plate V, fig. 1, we have fragments from a pipe bowl that seems identical with illustrated bowls from the Webb site and from the Webb stratum of Frank Bay.

The stone artifacts recovered by us are of little value in determining relationships. The complete Iroquoian celt (Plate II, fig. 9) and the Point Peninsula celt (Plate II, fig. 8) are the only non-ceramic specimens which can definitely be assigned to a culture, and these only by reason of their associations with pottery in TT1 and TT3 on this site. They offer no help other than that they are not in conflict with the ceramic evidence. The end-notched net sinkers may be of real significance in dating, when further information on the occurrence of sinkers in general is available. At the moment we note with keen interest that a few end-notched sinkers made from limestone are reported from the lowest occupational stratum of the Burley site, 6 to 8 feet down (Jury and Jury, 1952; Plate VI), which is not Iroquoian, and that Wright (1956: 194) reports the finding of net sinkers (type unspecified) in Point Peninsula associations in the Inverhuron area. Kenyon (1958: 46) evidently found evidence here for their Point Peninsula connections.

Stratigraphically, we can only show that the Iroquoian material overlies the Point Peninsula at the one point where the latter was found *in situ*. This is, however, the kind of evidence we need. Suitable conditions must exist on some sites for closely defining occupations which were separated by very short intervals within each culture. An attempt in this direction was made on the Parker Earthwork (Lee, 1958b); results there, although encouraging, showed that still more rigid control over vertical positions than was exercised would have been rewarding.

Such clues as we have, then, point to an approximate Middleport – Webb – Lalonde relationship. The general positioning in our overall Ontario sequences is provided in the superb results of F. Ridley on the Frank Bay site. However, he found Webb in association with Lalonde items (1954: 47) and the stratigraphy not clear at that point. Harper (1952: 54) states that Webb can be logically postulated as earlier than Lalonde and (p. 55) later than Middleport. Sweetman (1957: 4) found a late manifestation of Lalonde at the Boyd site and suggested an approximate date of A.D. 1250 to 1350. The writer, lacking any sound basis for dating the Iroquoian sequences, has tentatively applied Sweetman's estimate to the Parker Earthwork and at least one component of the Lawson site, upon noting the presence of Lalonde High Collar at both sites, in association with an unusual sherd type, Parker Festooned (Lee, 1958b). By the same approach, however unsatisfactory it may be, and in consideration of views shared with F. Ridley and published by him (1952: 13), I would place a certain portion of the Iroquoian material of the Lucas site in the same period. Beyond this I cannot go on present evidence. If Kenyon's estimate (1958: 46) of A.D. 1150 to 1250 is correct for the first Iroquoian use of the site, our entire Iroquoian sequence (and thereby its immediate predecessors) should be expanded still farther back in time. It is highly unlikely that all the Iroquoian material here represents a single moment in time; a desirable location such as this would almost certainly be occupied again and again. It is further unlikely that apparently related sites ranging geographically from Sarnia through Bruce County, through Huronia, and at least as far east as Toronto and as far north as Lake Abitibi (Ridley, 1956 and 1957) are entirely contemporaneous. More precise data are needed. It is my opinion that more careful and detailed work on even our shallow but undisturbed sites can produce it. Where soil stratigraphy is not visible or where the layers are more than one inch thick, trenching levels of not more than one inch would be helpful. Preferably, the depth of every artifact of significant or diagnostic character ought to be taken.

Point Peninsula

Consideration of the older ceramic component of the Lucas site brings into use another dating method, radiocarbon analysis, as applied to various manifestations of Point Peninsula in New York State and to a lesser degree in Ontario. This, coupled with the extensive and detailed work of Dr. W. A. Ritchie, provides us with a broad framework into which our Ontario sequences may be provisionally fitted. Although C-14 results leave a great deal to be desired (*see* Haury, 1957: 23), no other method in use in Ontario, where stratigraphic evidence is lacking, provides anything like the comforting security of radiocarbon dating. Through it, Dr. Ritchie and others have pushed the Point Peninsula culture far back in time with some degree of confidence. Neither the lower nor the upper limits of this culture, however, are satisfactorily placed. The accomplishment of Greenman (1951: 56) in bringing Point Peninsula almost up to A.D. 1800 in Ontario apparently stemmed from views once held which placed the culture between approximately A.D. 1000 and late prehistoric times (Ritchie, 1944: Plate 4 and 1949: 22). Similarly, Emerson, who writes (1956b: 190) of blazing Point Peninsula fires 3,000 years ago at the Long Sault Rapids near Cornwall, suggested earlier (1949: 21) that the culture of the Kant site in the Ottawa Valley was being formed there as late as the early sixteenth century by Point Peninsula peoples, where "they were subject to some slight amount of white contact before moving farther north and west." Even now, when radiocarbon has opened the way for recognition of a respectable time depth for Point Peninsula, we find Wright (1956: 194) bringing this culture up to A.D. 1000 in southern Ontario, in spite of the approximate terminal date of A.D. 600 published by MacNeish (1952: 86), Ridley's stratigraphic evidence at Frank Bay and his suggestion (1952: 13) that the Iroquoian occupation of Ontario is not shallow, and the reported finding (Lee 1951: 45 and 1952: 71) of many large and prolific sites, not previously known, which bridged the gap between Ontario's Owasco and Uren, yet showed ample signs of long development within the group itself. These sites I have called Glen Meyer.

The Lucas site, in terms of the evidence under consideration in this paper, can do little, if anything, toward resolving the problems of the ages of particular segments of Point Peninsula culture, although the relationships with old beaches and bars at Inverhuron may be of assistance when certain geological events are more precisely fixed in time. Its principal significance lies rather in its location, its association with other sites in the Bruce Peninsula, and the rather obvious indications that the grouping of such sites in the vicinity of the mouth of the Saugeen River has bearing on the entire question of the spread of Indian cultures in southern Ontario during Middle Woodland and earlier times.

Comparisons with the published Point Peninsula ceramic materials of Dr. Ritchie in New York State are facilitated by the presence of several recognizable sherd types at the Lucas site, which, while differing considerably in such matters as size of grit, as might be expected in different environments some 200 miles apart, are, in the opinion of the writer, yet sufficiently similar in designs and techniques employed to justify similar designations, rather than new classifications. The presence of Vinette Dentate, Vinette Complex Dentate, Point Peninsula Rocker-Stamped, Point Peninsula Plain, and something approaching Point Peninsula Corded has already been noted, with dentate stamping comprising 36.9 per cent and rocker stamping 14.5 per cent of the total decorated sherds. The ease with which percentages can be changed is illustrated by the fact that all but one of the rocker-stamped sherds came from one extension of a single test trench on the Lucas site. However, at the Malcolm site (Dailey and Wright, 1955: 19) a paucity of rocker-stamped sherds was instead explained by the authors as a case of "local differentiation."

In our Lucas collections, no St. Lawrence Pseudo Scallop Shell is seen. I believe that further trenching would reveal it, thereby altering the percentages. It is not improbable that Vinette 1 will also be found there, since it occurs on a related site only a few miles away (Lee, 1952: 69). The crossed trailings, which form rhombic and rhomboidal networks, are not identifiable to my satisfaction, in the absence of associated rims. Two sherds with exterior rim punctations which raise slight nodes on the inner surface may fall within the range of Wickham Punctate. Comparisons with the Kant site (Emerson, 1955b) and with the types described and chronologically placed by Ritchie and MacNeish (1949) suggest to the writer that a Middle Point Peninsula position, probably very early, is indicated for at least most of the Lucas material of that culture. Strong resemblances between some of the poorer and coarser Vinette Dentate sherds of the Lucas site and the sherds from the oldest level of the Burley site (Jury and Jury, 1952) suggest a close relationship. At Frank Bay (Ridley, 1954: 43,44) the Point Peninsula stratum produced the identified types of the Lucas site (with the addition of Vinette 1 and St. Lawrence Pseudo Scallop Shell), the later varieties of which were correlated by Ridley with Point Peninsula foci 2 and 3.

Almost all the stone artifacts are surface finds. At least one of the small celts (Plate II, fig. 8) is Point Peninsula. It is not unlikely that certain chipped slate objects and the end scrapers are a part of this culture. Ridley (1954: 44) found similar slate objects in the Point Peninsula stratum of Frank Bay. If the end-notched sinkers are a part of Point Peninsula, further relationship with the Burley site is indicated. A radiocarbon date, 2619 ± 220 (Jury and Jury 1952: 74), has been published for the pertinent stratum. It is my opinion that this does not present the full range of time involved, either at Burley or at Lucas. Emerson's more recent guess date of 500 B.C. for the Kant site (1955b: 51) is likewise helpful in arriving at a very rough estimate of the age of Lucas, although again I would favour an earlier date for both Kant and Lucas. Kenyon's estimate of 1500 B.C. (1958: 46) is not unreasonable, in my opinion, for the beginning of Point Peninsula on the Lucas site.

As stated by Carpenter (1953: 76,77), Point Peninsula is far from being limited to southern and eastern Ontario and northwestern and central New

York. Its Canadian limits are not yet known, but aside from its widespread occurrence over most of what is commonly known as Southern Ontario, this culture has been found on Manitoulin Island (Lee, 1953: 63), at Lake Nipissing (Ridley, 1954), at least as far west as Fort William (Lee, 1958c), at Lake Timiskaming and at least as far north as Lake Abitibi (Ridley, 1956 and 1957: 35), and in Quebec Province within the Ottawa Valley and at least as far north as Kempt Lake (Burger, 1953).

Greenman (1951: 61) found that a Point Peninsula adaptation to a lacustrine environment is abundantly indicated. I find that although twenty of my fifty-eight survey sites of this culture are on lake shores or on river-banks near their mouths, at least thirty-one sites are inland at the very beginnings of streams or in association with small bogs.

The distribution of particular foci within Point Peninsula in Canada is, for lack of study, less well known. Some information is available, however. Vinette 1 is of interest because of its occurrence in the immediate Inverhuron area and its bearing on any question concerning Point Peninsula origins. Ritchie (1955: 69,70) raises the possibility of Vinette 1 being in use in New York State almost 2,500 years B.C. and states that it was going out of fashion in central New York around 1000 B.C. If this range may be applied to Ontario, Vinette 1 becomes an important time-marker on a number of sites. As suggested earlier (Lee, 1952: 70), Vinette 1 is not necessarily the earliest pottery type in Ontario and may instead represent a slight backwash from New York State in early Middle Point Peninsula (Lee, 1952: 72). Within our knowledge, Vinette 1 continues to be scanty in Ontario. We find one of the greatest concentrations of it in the Inverhuron area, on the Knechtel site (Lee, 1952: 69), but it probably represents only a single vessel there. Ridley (1954: 43) reports several large rim-sections and many body sherds from the Frank Bay site on Lake Nipissing. Elsewhere we find one sherd (Vandewyngaerde site) near Port Bruce on Lake Erie (Lee, 1952: 65); five sherds at Chatham (S. Wortner, pers. comm.); one sherd from a small site at Waterford; and two sherds from the Parker site in the Trent Valley (Lee, 1952: 70). Further excavating on pre-Iroquoian sites may, of course, greatly alter this picture.

The Lucas site component of Point Peninsula appears to be most closely related, in terms of published sites in Ontario, with Kant, Frank Bay, Burley, and, to a lesser degree, with Malcolm. Comparable sites which have been dug or otherwise examined by the writer do not appreciably extend this geographical range.

SPECULATIONS AND CONCLUSIONS

The peculiar clustering and concentration of sites, both preceramic and ceramic, in the Inverhuron area but not much farther south, have significance for us in terms of the proximity of the mouth of the Saugeen River. As indicated earlier (Lee, 1952: 72,73), the Saugeen, which enters Lake Huron at Southampton, rises only 3 miles from the headwaters of the Grand River and possibly was part of a major travel route to the Niagara Peninsula. I continue to believe that both preceramic and ceramic peoples made extensive use of it. Evidences of cultural connections between Manitoulin Island and Inverhuron, in terms of firestone paving and certain unusual artifacts, have also been found during my survey at various points along the west shore of Bruce Peninsula. Movements along the Huron shore of Ontario seem to have halted for fairly lengthy periods in the Inverhuron-Saugeen area, where tremendous activities are indicated by the extensive remains. The environment seems particularly suited to an economy emphasizing fishing. For camping purposes, sandy ridges, whether along a shore or far inland, were attractive to the Indians of Ontario, particularly Point Peninsula. Presently, under population or other pressures, one group would move on and another would enter, often using the same camping ground, as stressed by Witthoft (1949:4) and as demonstrated at several sites such as Sheguiandah and Frank Bay.

The appearance of pottery in the Northeast, as represented by Vinette 1, may go back an approximate 2,500 years B.C. (Ritchie, 1955: 69). This type may not be the earliest in Ontario; it may have come out of Illinois (Lee, 1952: 72) in much later times by way of the Ohio Valley and New York State. We must keep in mind, however, that relatively little work has been done in Ontario on sites that are likely to produce this early ware. This is especially true in a critical area, Northern Ontario, where we find Vinette 1 reported only by Frank Ridley at Frank Bay on Lake Nipissing. Its presence has been noted at Inverhuron, not far from the Lucas site. Ritchie states (1955: 69,70) that it was apparently going out of fashion in central New York somewhere around 1000 B.C.

A dual wave of pottery diffusion from Asia is suggested by Ritchie (1955: 70), the first introducing a cord-marked ware ancestral to Vinette 1 and related wares; the second (possibly by a dolichocephalic people, Ritchie, 1951: 134) occurring more than a thousand years later, being responsible for the classic Woodland cord-imprinted, dentate, rocker-stamped, and punctate decorated groups, to which Vinette 2 ware belongs. An alternative suggestion is offered by Ritchie (1955: 70), wherein he sees a certain probability that transmission of actual ceramics and the idea, rather than the replacing of one people by another, took place in early Middle Woodland times among groups having an otherwise diversified cultural equipment.

Certain Laurentian – Frontenac traits, such as thick, broad-bladed, side-notched projectile points, carry over into early Woodland I times (Ritchie, 1951: 131). A probable overlap with several types of Vinette 2 is suggested by Ritchie (1949: 23) as Vinette 2 spread eastward across Ontario. He notes (1949: 23,46) an association of Laurentian type flint and ground slate points with Vinette 2 at the Parker site in the Trent Valley of Ontario, where his party excavated. Earlier work on the same site (Leechman and de Laguna, 1949) in 1947 seemed to show a similar association. Ritchie further notes (1953: 6) the addition of the first traces of pottery on certain sites in western and central New York which are still Laurentian.

The Lucas site, I believe, represents a fairly early development, probably Point Peninsula 2, within the Point Peninsula Aspect. Ritchie (1949: 23; 1951: 134 and 1953: 8) strongly urges a Canadian derivation for major parts of the New York Middle Point Peninsula. He notes (1946) that fundamental resemblances in decoration technique and design to the Illinois Hopewell were remarked by Griffin. The suggestion is made (Ritchie, 1953: 8) that Point Peninsula is a composite of cultural traditions stemming from the Middlesex and Hopewellian, with the addition of new traits from Ontario and with various local developments. The Hopewellian like decorative techniques of rocker stamping, dentate and complex dentate with an associated non-Hopewellian corded decorative feature, are seen by Ritchie and MacNeish (1949: 119) to continue throughout the entire temporal span of Point Peninsula.

Various forms of Vinette 2 pottery appear on several sites in the Rice Lake area of Ontario (Ritchie, 1946). Numerous sites over most of Southern Ontario produce similar material. Emerson, however, takes the view (1955b: 38) that the Kant site in the Ottawa Valley, while participating in the middle portions of the developing trends in Point Peninsula of New York, represents traditions peculiar to the Ottawa Valley. Similarly, his students, Dailey and Wright (1955: 19), while finding a connection between the Malcolm site in the St. Lawrence and the New York Point Peninsula, see "the equally strong suggestion of regional variation" at Malcolm. They note the increasing popularity of the pseudo-scallop shell and push-pull techniques as evidence of this and suggest eastern Ontario as the developmental centre for these. However, pseudo-scallop shell, often in combination with rocker-stamped, dentate, and punctated sherds, is very widely distributed, at least as far north as Lake Abitibi and at least as far west as Fort William (as well as in the Maritime Provinces and Upper New England: Ritchie and MacNeish, 1949: 120), while the push-pull technique has been observed on several sites at Inverhuron, including Lucas.

A definite separation from Hopewell levels in general occurred in Middle Point Peninsula times with the appearance of Pseudo Scallop Shell, Wickham Incised, and Wickham Punctate, which signified other connections (Ritchie and MacNeish, 1949: 119). The eastern United States, they suggest (pp. 122–3), could be regarded as essentially a single culture area until the end of Hopewellian times. By the beginning of Middle Woodland III (Point Peninsula 4) times, a decline had set in (Ritchie, 1955: 69). Both the New York and Ontario areas underwent similar developments at this time (Ritchie, 1949: 23). The earlier interest in mortuary matters fell off, and the simple flexed burial with few or no grave goods became the rule (Ritchie, 1951: 134). Individual developments along divergent paths began in the Late Woodland and Early Mississippi periods (Ritchie and MacNeish, 1949: 122–3), which include their Owasco and Iroquois Aspects.

The concept of continuity in the development of the Iroquois in the Northeast through the Owasco and Point Peninsula Aspects was urged by Griffin in his Fort Ancient work. Since then, a considerable body of supporting evidence has been advanced. Ritchie and MacNeish (1949: 121, footnote) see a hint at Middle Woodland Owasco prototypes in the area of Rice Lake, Ontario. They (p. 120) find a seeming generic resemblance in Point Peninsula Corded Punctate, Jack's Reef Corded, Jack's Reef Corded Collar, and the earlier Point Peninsula Corded to types appearing in varying strength in the Owasco horizon. Ritchie (1949: 20) states that, beyond doubt, Wickham Corded Punctate emerges from the earlier Jack's Reef Corded Punctate type. He suggests similar genetic relationships between the Owasco Corded Horizontal and the Point Peninsula corded types and (1953: 9) a gradual cultural transition from late Point Peninsula to early Owasco, apparently owing to internal developments rather than to external causes, and that such transition has been partly demonstrated by recent researches. Dailey and Wright (1955: 13,17) see "inconclusive" evidence of such transition in two types of aberrant sherds at the Malcolm site. Some slight evidence in this direction was observed by the writer at Point Pelee (Lee, 1951: 44) and at the mouth of the Sauble River, north of Southampton (confined here to a single corded vessel). Wright, who in opposition to the views of Dailey (Dailey and Wright, 1955: 17, footnote 8) felt that the evidence was far too fragmentary for such conclusions, appears to favour them in his 1956 publication (p. 194).

Yet the picture is by no means entirely satisfactory. I (1952: 73) expected that transitional sites would be found in Ontario. Something of the sort is presented by Ridley (1954). At the splendidly stratified site of Frank Bay he noted "a primary transitional stratum" superimposed on Point Peninsula (p. 44), followed by the "Frank Bay transitional stratum" (p. 45), which has much in common with the Glen Meyer series in southern Ontario. In my extensive survey operations across Ontario, which have involved the discovery and examination of some hundreds of sites, including many Point Peninsula and Owasco, transitional sites linking Point Peninsula to Owasco have been conspicuous only by their near-absence. This is more than a little disturbing, in view of the known vast territories occupied by Point Peninsula and Owasco peoples. A partial derivation, as noted by Ritchie (1946: 17), is surely indicated, but, as he states, there is much which argues against "the simple assumption of a Point Peninsula derived Owasco complex." Some of the difficulties are outlined by Ritchie and MacNeish (1949: 120–21). They include numerous non-ceramic differences, especially in the diagnostic traits of each culture; the near-absence of the dentate and the total absence of the rocker-stamping techniques from the Owasco series, both of which are apparently strong in the final stages of Point Peninsula, with rocker-stamping still ascendant; the near absence of appliquéd collars and the crisscross decoration in Owasco; and, as indicated by Ritchie (1946: 17 and 1953: 9), the contrary craniological evidence. These features, it would seem, are not part of "a gradual transition from Point Peninsula to Owasco," and some of them can only be described as representative of an abrupt break. Why this should be, over such vast areas, is not immediately clear, but at this time I find it impossible to dismiss the concept of a new people who absorbed some small portion of the previous culture and inhabitants of the area.

If, on the other hand, the Glen Meyer series, or a part of it, was contemporaneous with New York's Owasco, as has been suggested to the writer by Mr. Frank Ridley, a strong case for a transition through Glen Meyer rather than, or as well as, Owasco could be advanced. Certainly some clear Owasco elements are present on the Boys site east of Toronto (Ridley, 1958) and on the Goessens site (one vessel, Lee, 1958a: 40) at Tillsonburg (type site for Glen Meyer). A changed dentate stamping persists, among other features, although the rocker technique has not been observed. The analysis of our very large collections from several Glen Meyer sites will be undertaken when circumstances permit and should do much toward answering a number of pertinent questions. The work of Dr. C. H. D. Clarke and Mr. F. Ridley at the Boys site is an important step in this direction.

It has been suggested by Griffin (1943: 368) that a gradual and discernible transition from a Woodland pottery complex into an Iroquoian complex took place in the northern Ohio area near the close of the Hopewellian chronological period. If the Glen Meyer sequence in Ontario, with its hint of Hopewellian influence (Lee, 1951: 47), occupies the position between Ontario's Owasco and Uren, as postulated by the writer (1951: 45 and 1952: 73), this province may be included in Griffin's concept, and the evidence for his suggested transition becomes overwhelming.

A sequence of sites, beginning with Uren and leading to Lawson, was worked out by the late W. J. Wintemberg of the National Museum of Canada. It has been considered as a Neutral sequence, rising almost into historic times, which would appear to fit the theory advanced by MacNeish (Ritchie, 1951: 134) of an *in situ* genesis of the Iroquois groups stemming from four separate Owascoid or Owasco sequences in southern Ontario and in New York State. That tribal identities can be traced so far back seems more than doubtful, in terms of our Ontario materials. Under the impact and influence of Ridley's work, I have abandoned previous positions, which arose out of an emphasis on the examination of the presumed Neutral area north of Lake Erie, and have come to see that certain manifestations formerly regarded as Neutral markers are widespread over southern Ontario, at least. I, in company with F. Ridley, now regard these as Iroquoian, rather than Neutral or exclusively ancestral to Neutral. Middleport elements are prominent in the Bruce Peninsula and are turning up in quantity in the Toronto area. The later Webb and Lalonde complexes, as represented at the Lucas site, cover an enormous area which cannot possibly be regarded as the territory of the Neutral, the Petun, or the Huron. We see, instead, an overall general cultural development in southern Ontario, as postulated by Harper (1952: 55), a great deal later in time than the suggested Owasco or Owascoid divergencies, which is so similar over the area involved that we cannot distinguish particular lines of development leading specifically to any one historic tribe, but which is instead ancestral to several of them. If historic sites in the various tribal areas could be identified, as in the case of Ste. Marie near Midland (Kidd, 1949), tribal units might be traced backwards, but not very far. They would soon merge with the broader cultural developments that I have attempted to outline, and be lost in them.

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PLATE I

A. Lucas site, Inverhuron, from northwest. Taylor and Dawson surface collecting in area of TT1.

B. Lucas site. Pit feature in TT2, Iroquoian.

A

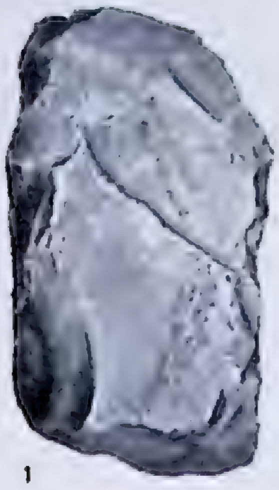
B

PLATE II

Lucas site stone tools

Fig. 1. Chipped slate.
Fig. 2, 3. Net sinkers.
Fig. 4. Rough scraper.
Fig. 5. Small chopper.
Fig. 6. Axe.
Fig. 7–9. Celts.
Fig. 8. Point Peninsula.
Fig. 9. Iroquoian.
Fig. 10. Chipped and ground slate.
Fig. 11, 15. Hammerstones.
Fig. 12. Thick plano-convex axe blade, natural surface on convex side.
Fig. 13. Blade of axe, much blunted from use.
Fig. 14. Pitted anvil stone.
Fig. 16. Evidence of disturbance by square-mouthed shovel.

PLATE II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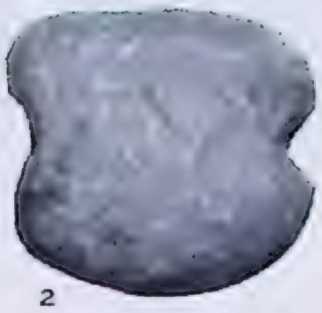
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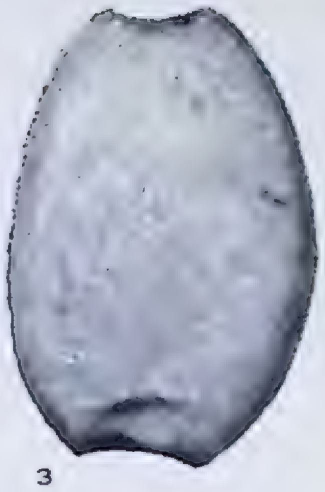
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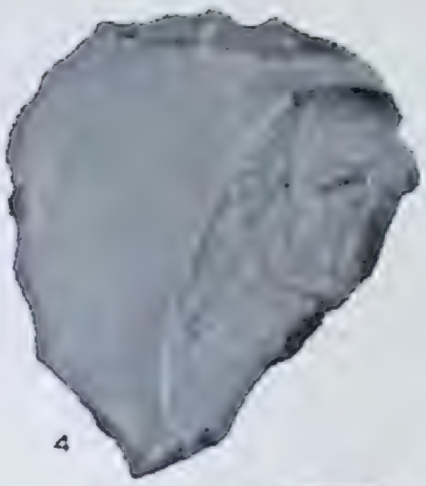
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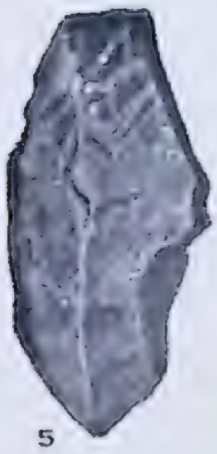
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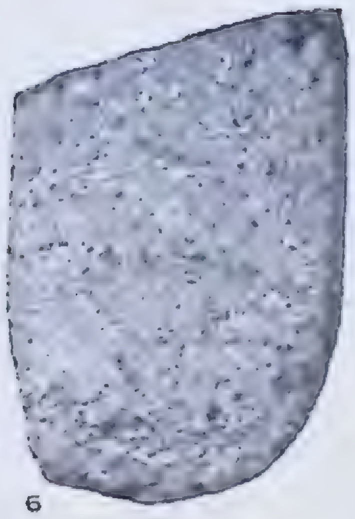
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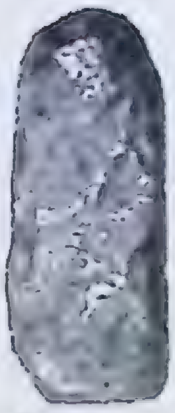
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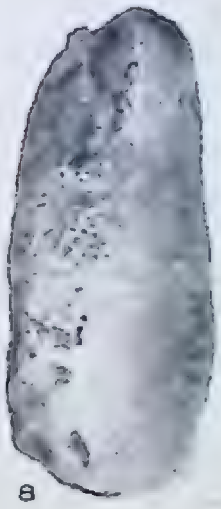
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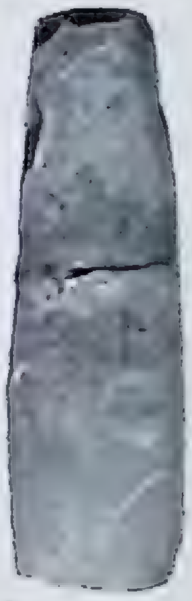
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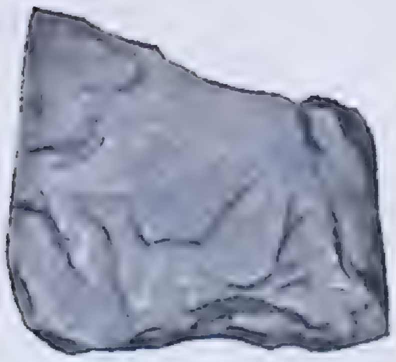
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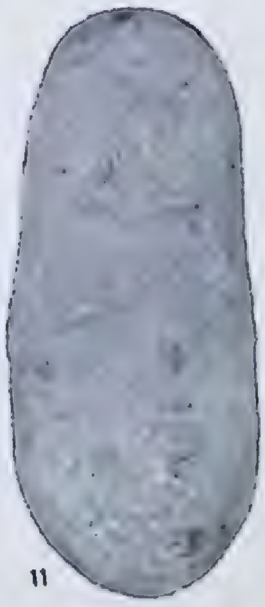
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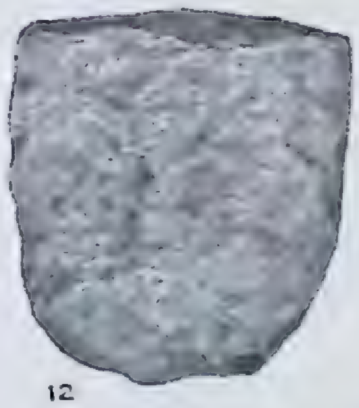
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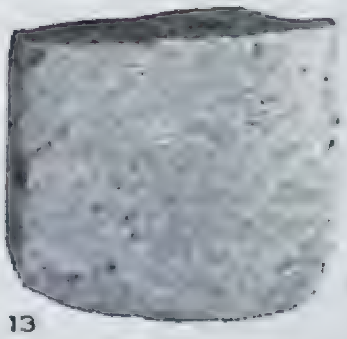
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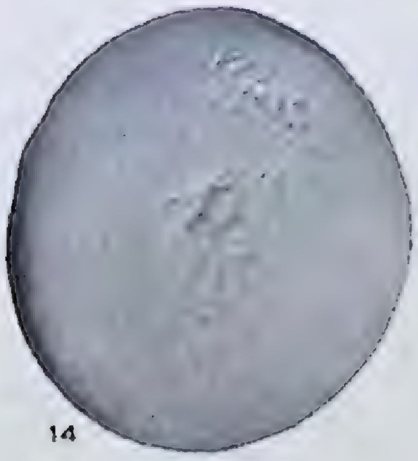
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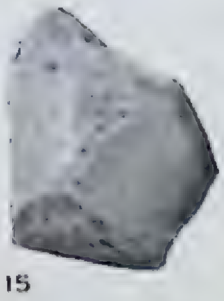
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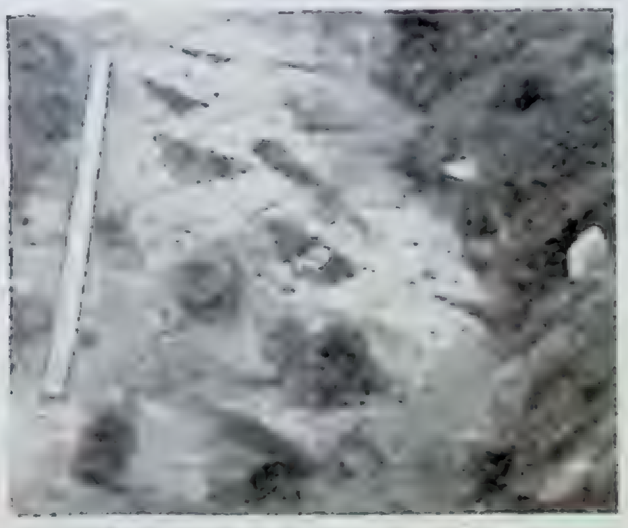
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INCHES

Plate III

Lucas site Point Peninsula pottery

Fig. 1. Rim sherd, thong-wrapped stick.
Fig. 2. Cord-malleated body sherd.
Fig. 3. Coarse cord-impressed.
Fig. 4. Cord-wrapped paddle, body.
Fig. 5. Rim, cord-impressed.
Fig. 6. Crossed trails, body.
Fig. 7. Complex dentate, body.
Fig. 8. Interior channelling, body.
Fig. 9–12. Rocker stamp. Fig. 9 and 10 are rims.
Fig. 13–16. Dentate. Fig. 13 and 16 are rims.
Fig. 17–19. Variations of pseudo-scallop shell.

PLATE III

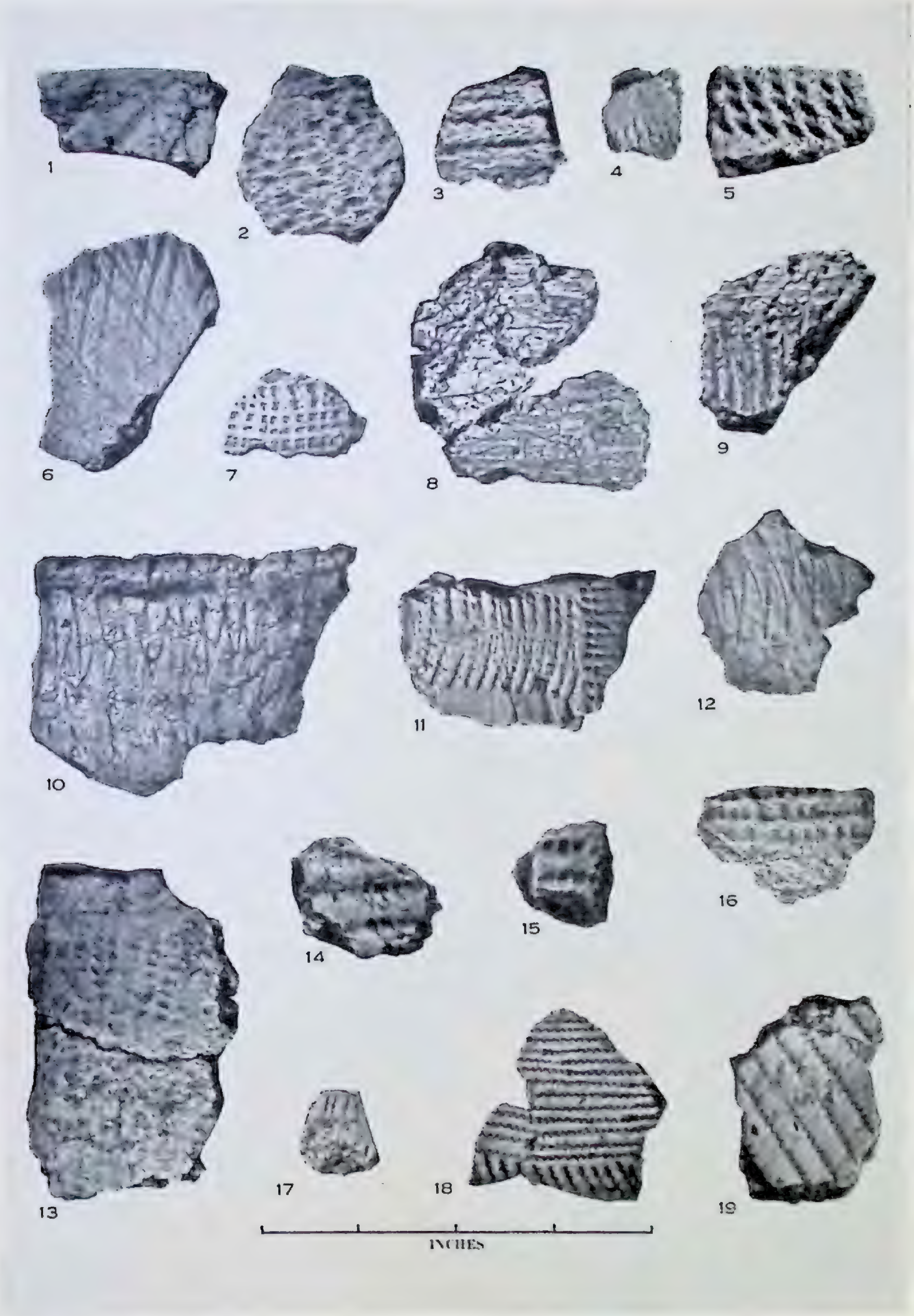


PLATE IV

Lucas site Iroquoian pottery

Fig. 1–4. Rim sherds.

Fig. 5. Grooved paddle, body.

Fig. 6. Lalonde sherd type.

Fig. 7. Rim sherd.

Fig. 8. Lalonde sherd type.

Fig. 9. Unusual shoulder design, possibly from toy pot.

Fig. 10. Rim sherd.

Fig. 11. Twig (?) impressed.

Fig. 12–15. Rim sherds.

Fig. 16. Lalonde sherd type.

Fig. 17. Rim sherd.

Fig. 18. Body, shows where added clay strip has scaled away.

Fig. 19. Cordwrapped paddle edge, rim.

Fig. 20. Lalonde sherd type.

Fig. 21–24. Rim sherds.

(Fig. 3 and 17 are castellated. Fig. 8, 10, and 17 fall within the range of Lalonde. Fig. 22 shows characteristic erosion of sherds on wind-blown sand surface.)

PLATE IV

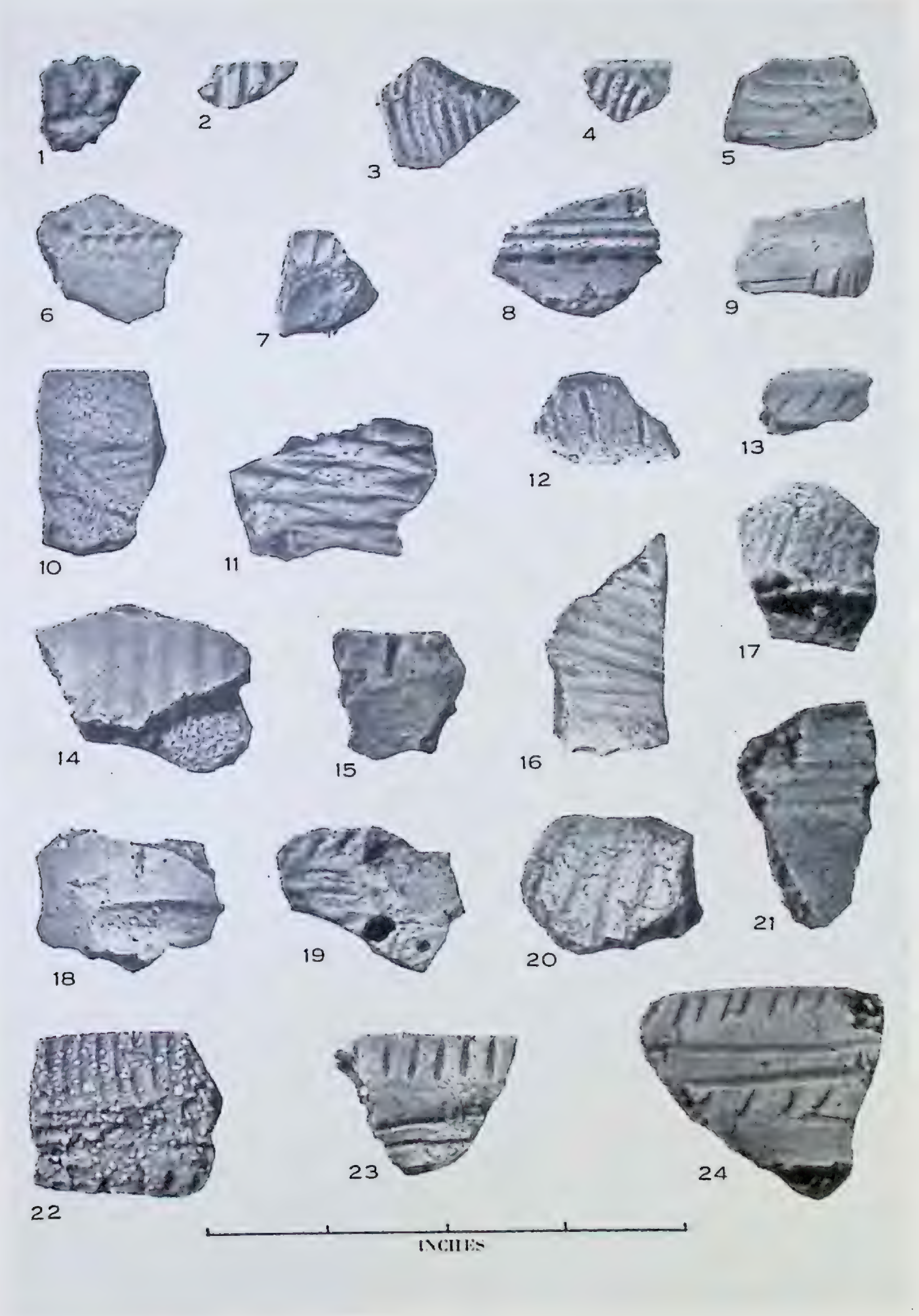
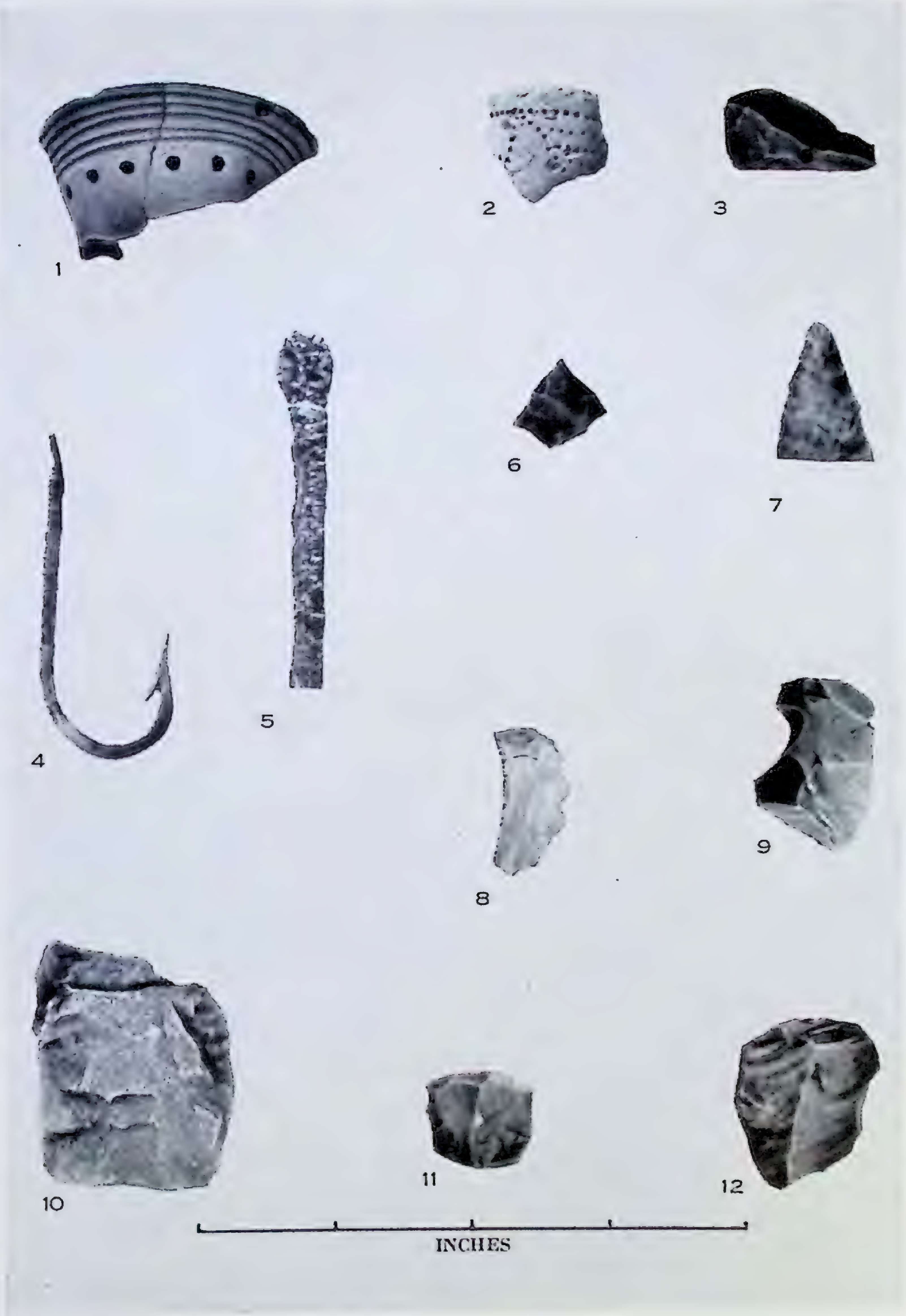


PLATE V

- Fig. 1. Flaring pipe bowl fragment.
- Fig. 2. Punctated pipe-bowl fragment.
- Fig. 3. Base of chert tool.
- Fig. 4. Iron hook of unusual design.
- Fig. 5. The flattened tip (enlarged) of the shank, bearing the number 13.
- Fig. 6. Tip of chert tool.
- Fig. 7. Probably the tip of a projectile point.
- Fig. 8. Flake scraper with graver point.
- Fig. 9. Flake scraper, unmodified.
- Fig. 10. Base of quartzite tool.
- Fig. 11, 12. End scrapers.

PLATE V



BLOOD GROUPS IN ANTHROPOLOGY: WITH SPECIAL REFERENCE TO CANADIAN INDIANS AND ESKIMOS

By Bruce Chown and Marion Lewis[1]

> "The underlying factor in the classification of human beings consists in the genes which are transmitted from generation to generation, and which, taken together, determine its innate physical composition.
>
> "The races of the present day are but temporary integrations in the constant process of mutation, selection, and mixing that marks the history of every living species that maintains itself by sexual reproduction."
>
> Arthur E. Mourant,
> *The Distribution of the Human Blood Group.*

In the person whose blood is tested, the blood group antigens mark the presence of the genes that control them. They are the objective, clear-cut evidence for single genes controlling essentially physiological characteristics, characteristics which are unaffected by external agencies, persist from conception to death, and are likely to be handed on from generation to generation. When compared with other physical characteristics long used in anthropology, they have certain advantages and certain disadvantages. Their chief advantages are the relative simplicity of their demonstration, their completely objective character, their simple and clear-cut mode of inheritance, and, perhaps above all, the fact that they cannot be altered by environment. Their disadvantage is their all-or-none character; it is easier to lose a single gene that of itself determines a single character than to lose a group of genes that in combination determine such a characteristic as skin colour, for example. And yet this works both ways. We have, for instance, studied a number of Indian populations which, so far as general body conformation, skin and eye colour, hair colour and texture go, looked purely Indian; yet they proved beyond question to have many non-Indian blood group genes. Characteristics requiring the action of several or many genes were not measurably altered, nor was there any evidence that we were dealing with a hybrid population; whereas the single-gene characters gave clear evidence.

We have been particularly interested in trying to determine the genetic relationship of the Indians and Eskimos to one another and to peoples elsewhere in the world. As Mourant would say, the present-day Indians and Eskimos are but temporary integrations in the constant process of mutation, selection, drift, and mixing that has been going on since man became man, and even before, so that one might ask, is it possible, let alone probable, that you can trace the ancestry of the Indians and Eskimos through a handful of blood group genes? We think that, given time, support, and effort, it will be both possible and probable. It will not be easy. There will be many errors both of fact and of deduction, many false leads, many disappointments. We know nothing about mutation of the blood group genes; we assume that the frequency of mutation is in the general level of that of other genes. We are just beginning to learn something of the effect of selection and to see a little more clearly that of genetic drift. Our view of the result of racial mixing on gene frequencies is purely mechanical, although in their new surroundings the expression or survival of imported genes may perhaps be altered; we are getting our first hints of the effects of one gene upon the expression of another. But the first blood group was discovered less than sixty years ago, and the most recent one was reported only three years ago. Considering the shortness of time a good deal has been learnt; the future promises a rich harvest.

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[1] Rh Laboratory, University of Manitoba.

The Blood Group Systems

A blood group system may, as a first orientation, be described as follows:

(*a*) It is evidenced by one or more separate chemical substances (antigens or agglutinogens) in or on red cells.

(*b*) Each antigen is defined by a reagent (antibody) that, reacting with red cells that contain the antigen, causes them to stick together, clump, or agglutinate.

(*c*) The antigens are inherited characteristics controlled by genes.

(*d*) The genes of a given system are inherited independently of the genes of any other system.

There are ten such systems presently recognized; these are listed in Table I.

In addition to the systems listed in Table I, a number of blood group antibodies have been reported that may, perhaps, prove to be part of one or other of these systems or the progenitors of further systems, while beyond question still others will be found.

Collection, Interpretation, and Reliability of Data

Blood grouping is in principle simple, in practice full of traps for the unwary. Race and Sanger have somewhere said that blood grouping seems to be a discipline in which one must almost inevitably serve an apprenticeship to error. This is true. We have certainly experienced it in our work and have had at times to jettison whole bodies of data that had been accumulated with much labour. Not only must one be expert in all the various techniques that may be necessary when one is using forty or fifty sera in a study, but, even more, one must know one's sera through long acquaintance with them. It is, we think, a not uncommon and a serious mistake to obtain through purchase or gift a collection of sera, set-out to "do blood grouping," and, without further experience, publish the results as if the whole thing were as simple as could be and the results obtained infallibly correct. We have come to believe too, that in order to allow a reader to judge of the accuracy of data in a report, the reporter should state exactly what methods he used with each serum, and what precautions he took to make certain that apparently unusual results were really what they appeared to be.

TABLE I

THE BLOOD GROUP SYSTEMS

Name	Abbreviation	Antigens	Date of first discovery	Discoverers
1. ABO.........	same	$A_1,A_2,A_3,A_4,..,B_1,B_2,O,H$	1900	Landsteiner
2. MNSs........	same	$M,N,N_2,S,s,S^u,Mi^a,Vw,He,Hu,M^g$	1927	Landsteiner and Levine
3. P............	same	P_1,P_2,p	1927	Landsteiner and Levine
4. Rhesus.......	Rh	$C,C^w,C^u,C^x,c,c^v,D,D^u,D^w,E,E^w,E^u,e,f,V$	1939–1940	Levine and Stetson Landsteiner and Wiener
5. Lutheran......	Lu	Lu^a, Lu^b	1945	Callender and Race
6. Lewis.........	Le	Le^a, Le^b	1946	Mourant
7. Kell..........	Kk	K, k, Kp^a, Kp^b	1946	Coombs, Mourant, and Race
8. Duffy.........	Fy	Fy^a, Fy^b, (Fy?)	1950	Cutbush, Mollison, and Parkin
9. Kidd.........	Jk	Jk^a, Jk^b	1951	Allen, Diamond, and Niedziela
10. Diego.........	Di	Di^a, (Di?)	1954	Levine, Koch, McGee, and Hill

NOTE: Antibodies defining the two antigens shown in brackets have not been reported; the existence of these antigens is assumed. Only the first discoverers of each system are given. Many of the antigens of the various systems were discovered at later dates by the same or other investigators.

In addition to this, what is possible depends also on the conditions under which specimens are collected and examined. Some blood group antigens, notably A and B, stand up to much rough usage; others are difficult to demonstrate even if the blood is only a day or two old. We have ourselves preferred to do our blood grouping in the field on strictly fresh specimens. Aside from the freshness of the specimens there are the advantages of dealing with real people and of avoiding bias in the data, through the use of families or close relatives for gene frequency material, by selecting at first hand and on one's own responsibility. There is the added advantage of studying whole families or sibships so as to determine both genotypes (rather than phenotypes) and the inheritance of the genes under study. The disadvantages of carrying out testing in the field are the obvious ones of makeshift and incomplete facilities so that some tests cannot be done. Then too the time for study is limited to those short periods each year during which one can get away to carry out the work.

Ideally, blood group work should be applied to population studies through the co-operative action of a team trained in social anthropology, population genetics, physical anthropology, and sero-hematology, and, under certain circumstances, other specialties, all members of which need not be in the field at one time. Such teams scarcely exist on any permanent basis as yet, although *ad hoc* teams have at times been organized with fruitful results. We ourselves have felt keenly the inadequacy of our knowledge and experience in the broad field of anthropology, and while we have defined our population samples as accurately as we could, we have undoubtedly made mistakes. Is it too much to hope that we may yet find ourselves carrying out blood group gene population and inheritance studies with others in Canada—or elsewhere—trained in the other essential sciences?

Once data are collected they require statistical analysis, the results of which must be tested to ascertain the probability that they represent what they are believed to represent. In most cases, analysis and the estimate of probability can be carried out by simple methods. In a few cases, for example, when a number of Rh phenotypes occur in a small sample, it is wiser to report only the facts observed.

The Blood Groups of the Indians and Eskimos

The ABO System

It is unnecessary to review in detail all the studies that have been carried out on this system. Broadly speaking, the Indians of North America have one thing in common, absence of phenotype B and apparent absence of the gene *B*. We say "apparent absence" for one reason; in a number of studies a few Indians of genotype AB have been reported in the absence of phenotype B in the same population. This suggests the possibility that there may be among the Indians modifying genes that suppress *B*, as in the cases reported by Bhende *et al.*, (1), Levine *et al.*, (2) and others. It would be highly desirable to carry out really detailed studies, including serum types, antigen content of sera and saliva, and Lewis typing, in addition to red cell grouping, on the populations in which such AB people have been reported.

For a time it was held that pure-blood Indians were group O and that all *A* and *B* genes found in any Indian population were derived from intruders, white, black, or yellow. This myth was exploded by Matson and his collaborators (3) and by Boyd (4). What Matson found was that the frequency of A in the Blood-Blackfoot-Peigan confederacy of southern Alberta and Montana was exceedingly high, higher than in any other known population. Boyd showed by mathematical analysis that the frequency of A in many other tribes could not possibly be accounted for by recent hybridization. The gene *A* occurs in lower frequencies in the tribes of the plains and eastern woodlands. It is absent in some of the tribes of the west coast, and apparently absent in some of those of the far northwest, although data on the latter are inadequate to be certain of this.

In Central America the *A* and *B* genes are probably absent. In South America both *A* and *B* are present in the people of the Andes. East of the Andes, *A* is present in the south (the people of the Pampas) but apparently not in the north, i.e. in Brazil and the neighbouring northern states (the people of the Amazon).

The Eskimo, in contrast to their neighbouring Indians, do have the B gene as well as A and O. The frequency varies a good deal from one small community to another, but the overall frequency is about 30 per cent A and 7 per cent B gene. The frequency of B is a good deal lower than that found in Asiatic populations, both A and B frequencies being similar to those of western Europe. This finding does not disagree with the hypothesis of their derivation from the area of the Urals at a time when the flow of B into this area had not reached the heights it has today. All A genes in both Indians and Eskimos are A_1; A_2 does not occur.

The MNSs System

The overall picture for both North and South America is a high frequency of M and a correspondingly low frequency of N. Very little has been reported on the Ss antigens and their relative frequency of association with M and N. The published reports are summarized in Table II.

TABLE II

DISTRIBUTION OF THE MNSs GENES IN INDIAN AND ESKIMO POPULATIONS

	No.	MS	Ms	NS	Ns
Chippewa (Minnesota)	161	.296	.424	.046	.234
Blood (Alberta)	104	.3014	.5652	.0686	.0648
Stoney (Alberta)	145	.1770	.7092	.0748	.0390
Cree (James Bay)	165	.3735	.3578	.0000	.2666
British Columbia (several tribes)	300	.1588	.6112	.0206	.2094
Navaho (New Mexico)	97	.1847	.7019	.0620	.0514
Eskimo (Hudson Bay)	54	.0630	.5666	.0000	.3704
Eskimo (Midwestern)	67	.1896	.6164	.0000	.1940

The tribes do differ from one another, while retaining the common pattern of $M > N$ and $s > S$. The Chippewa of Northern Minnesota and the Cree of James Bay are closely similar; they are tribes that were in close contact when first known by the Whites and have undoubtedly exchanged genes many times. The Stonies, western remnant of the Assiniboine, differ from all others in the high frequency of Ms but are closer in this respect to the Bloods, their present near neighbours, than to the other tribes.

As to the other antigens in this system, no reports are available about the antigens Mi^a, Vw, and Hu. We have tested Cree and Blood Indians for He but have not found any that have this antigen. It appears so far to be confined to Negroids, positive reactors varying from approximately 2.5 to 12 per cent in the populations studied.

The P System

The P system consists of three allelic genes, P_1, P_2, and p, whose products are defined in red cells by two antibodies, anti-P+P_1 (anti-Tj^a in earlier terminology), and anti-P_1 (anti-P in older terminology). However anti-P+P_1 in the new sense (anti-Tj^a) is rarely available for use in anthropological studies, so that the latter are usually confined to tests with anti-P_1 (anti-P in the older terminology). This allows the classification of people into the two phenotypes P_1+ and P_1-, which is a perfectly useful type. P_1+ includes genotypes P_1P_1, P_1P_2, and P_1p, while P_1- includes genotypes P_2P_2, P_2p, and pp, but gene p is very rare, so that one will not go far astray if one disregards it and calculates on a two-gene basis, equating P_1+ with genotypes P_1P_1 and P_1P_2, and P_1- with genotype P_2P_2.

The *P* antigens are not certainly stable, so that tests carried out on blood specimens shipped from a distance to a central laboratory are open to question. There are also difficulties in field studies, since most examples of anti-P give clear reactions only in the cold, around 6°C., and such temperatures are not always attainable under field conditions. Using in our own studies a naturally-occurring human anti-P_1 serum at a controlled temperature of 6°C. in the field one found a frequency of gene P_1 of about 0.60 for Indians and 0.30 for Eskimos.

Rh or Rhesus System

The basic gene complexes of this system are well known, *CDe* (R_1), *cDE* (R_2), *cDe* (R_0) and *CDE* (R_z) making up the common Rh-positive or D-positive complexes, and *Cde* (R'), *cdE* (R''), *cde* (r), and *CdE* (Ry) the common Rh-negative or D-negative complexes. Gene *C* has three relatively rare alleles C^w, C^x, C^u; *D* the rather common allele D^u and apparently a constellation of rare alleles, which may be designated together as D^w; *E*, the rare alleles E^w and E^u, and c the rare allele c^v. Further than this the expression of the genes may be modified by factors both within and outside the system. So, for example, *D* may be weakened when it is partnered with *Cde* or *CdE*, while *C* may be weakened when it occurs in the complex *CDE* or *CdE*. Or again, under presently undefined but genetically determined conditions, the only antigen to be synthesized is the antigen D, the antigens C,c,E and e having failed to develop. Finally there are two antibodies, anti-f which reacts with all, or practically all, bloods carrying either complex cde or cDe, and anti-V which reacts with nearly half of the bloods of Negroes who carry cde or cDe, but with only about 0.5 per cent of the bloods of Whites who carry these complexes. Most anti-c and anti-e sera contain anti-f.

It can be seen that the system is quite complex. From the anthropologist's point of view, there must be not only a realization of this complexity but also an appreciation of certain technical consequences. For example, most anti-C sera also contain anti-D; most anti-E contain anti-c (and some of them anti-Wr^a), while most anti-c contain anti-E. Some anti-C sera that give a strong reaction with bloods in which the C is carried in the combination CDe will react weakly or not at all with bloods in which C is carried in the combination CDE. Weak forms of the antigen D, so-called D^u, will not react at all with many anti-D sera by the slide technique, which technique is commonly used in the field to the exclusion of all others. In our experience, for example, nearly half of all bloods that on first test react as C+, c+, D−, E−, e+, will prove to be D+ when a more sensitive anti-D test is carried out. The first reactions indicate *Cde.cde* as the genotype, the second $CD^ue.cde$. Any report assigning to a population a high frequency of *Cde* is suspect unless the absence of CD_ue has been proved by the most sensitive methods.

All this may sound hopelessly complicated. It really is not; it simply indicates the need for a good deal more than a nodding acquaintance with blood groups and blood group methods before one can pass judgment upon them.

The common Rh genes in the Indians of both North and South America are *CDe* (R_1) and *cDE* (R_2) which together make up from 70 to 90 per cent, the remainder being *cDe* (R_o), *CDE* (R_z), and *cdE* (R''). The frequency of *cDE* (R_2) appears to be highest in the northwest, reaching a frequency of 61.0 in some of the tribes of the coast of British Columbia, and diminishing as one goes south to levels around 30.0 in the southern United States and in the northern part of South America. Arteaga *et al.* (5) have reported a measurable frequency of *CdE* (R_y) in the mixed population of Mexico City and in one Mexican Indian tribe, while Boyd and Boyd (6) recorded groupings on two Ramah Navaho Indians which could be interpreted as indicating the presence of *CdE* (R_y). An extension of these studies through Mexico and Central America might prove most revealing. As to Eskimos, Ahrengot and Eldon (7) in Greenland, Laughlin (8) in the Aleutians, and Matson and Roberts in Alaska (9) found *CDe* (R_1) to be predominant, with *cDE* (R_2) following and an appreciable number of *cDe* (R_o), and *CDE* (R_z). In our own studies we have found *CDe* (R_1) and *cDE* (R_2) to lie close to 0.5 each. We have not been able to prove the presence of either *cDe* or *CDE*.

The use of anti-f has proved disappointing. Sanger, Race, Rosenfield, Vogel, and Gibbel (10) put forward the hypothesis that *f* occurred primarily in the gene complex *cdef*, and that it later occurred in an association with *cDe* through crossing-over. According to this hypothesis, while nearly all *cDe* complexes derived from a Caucasoid population, in which *cdef*, *CDeF*, and *cDEF* are the common primary complexes, would be *cDef*, none of the *cDe* complexes derived from a Mongoloid population in which the primary complexes are *CDeF* and *cDEF* would be *cDef*. Anti-f should then distinguish between, let us say, *CDeF.cdef* in which the *cdef* was the result of White hybridization, and *CDeF.cDeF* in which the *cDeF* was a native Indian gene; the first should be f-positive, the second f-negative. All such bloods that we have tested in our Indian studies—and also in a small group of Nigerians—have been f-positive. Our evidence does not disprove the hypothesis, but it calls it in doubt.

The Kell System

This system is made up of four genes K, k, Kp^a, and Kp^b, defined by the four antibodies, anti-K, anti-k, anti-Kp^a, and anti-Kp^b. The genes occur in pairs KKp^b, kKp^b, and kKp^a. KKp^a has not been isolated. We have found two sisters whose blood does not react to any of the four antibodies and have given them the phenotypic name K^o. In our experience all pure-blood Indians and Eskimos are K-negative, of genotype $kKp^b.kKp^b$. The report of 10.17 per cent K-positive in a small group of Brazilian Indians requires verification. It is quite possible that the antiserum used in this study contained a second antibody, possibly anti-Di^a (*see* later), which does not react with the blood of Caucasians but does with that of a measurable proportion of Indians.

The Duffy System

Up to 1955 the inheritance of this system was thought to be governed by two allelic genes, Fy^a and Fy^b. This belief was based on extensive population and family studies in Whites using anti-Fy^a, which is fairly readily obtainable, and confirmatory smaller studies in the same population with anti-Fy^b, of which there is scarcely any. In 1955 Sanger, Race, and Jack (11) found that about 75 per cent of Negroes tested with both anti-Fy^a and anti-Fy^b were negative to both, and proposed the existence of a third allele, *Fy*. This seems to us a more likely assumption than either of the alternatives, that there is no representation of the Duffy locus in these people or that its expression is suppressed. If an antibody defining the assumed third allele can be found, it will prove of great value in anthropological studies.

In Caucasians approximately 66 per cent are Fy(a+), the gene frequencies being about 40.0 Fy^a and 60.0 Fy^b. In Chinese and Japanese 98 to 100 per cent are Fy(a+). In our own studies the few Japanese that we have found to be Fy(a−) have been Fy(b+), so that it is a reasonable assumption that in Mongoloids only the two genes Fy^a and Fy^b occur, as is true of Caucasians. In our studies of Indians and Eskimos we have made use of only anti-Fy^a. Among the Indians the frequency of Fy(a+) has run in the neighbourhood of 90 to 95 per cent and in Eskimos 100 per cent.

The Kidd System

This system, so far as is known at present, is made up of two allelic genes, Jk^a and Jk^b, governing the development of the antigens Jk^a and Jk^b defined by the two antibodies anti-Jk^a and anti-Jk^b. Some at least of the antibodies are "naturally-occurring." They are difficult to work with and tend to deteriorate quite rapidly, so that relatively little work has been done with them. The frequency of the gene Jk^a has been estimated to be about 50.0 in Caucasians, 75.0 in Negroes, and 30.0 in Asiatics. We found its frequency to be 72.0 in Blood Indians and 38.0 in Indians of the Pacific Coast. We would not place much emphasis on the latter finding since the blood specimens for this study were sent to us by mail.

The Lutheran System

This system is made up of two allelic genes Lu^a and Lu^b governing the development of the antigens Lu^a and Lu^b defined by the two antibodies anti-Lu^a and anti-Lu^b. Up to quite recently, only anti-Lu^a has been available for use. In Caucasians and Negroes the frequency of Lu(a+) runs about 7 per cent, whereas Asiatics are all Lu (a−). All Eskimos and Indians that we have tested have been Lu(a−). One small group of Brazilian Indians has been reported to be 16.44 per cent; this report needs verification.

The Lewis and Secretor Systems

The ABO and Lewis systems, although inherited separately, affect one another and are, in a way, variations on a theme that is quite different from that of the other systems; their antigens, which are polysaccharides, rather than being confined to the red cells are dispersed through all the tissues, secretions, and fluids of the body, reaching their highest concentration in the mucous secretions, while their antibodies are "naturally-occurring," that is to say, are normal constitutents of the serum rather than rare abnormalities of the serum developing in response to known antigenic stimuli of pregnancy or transfusion.

The genetics and metabolic relationships of the Lewis system are not clearly understood, the best attested theory being that developed by Grubb and by Ceppelini. According to this, there are two genes, dominant *L* and recessive *l*, the primary function of *L* being the production of a polysaccharide called Le^a in the mucous secretions. In other words, the system is a secretor system rather than a red cell antigen system. The expression of *L* is influenced by the ABO(H) secretor status with a resultant effect upon the red cells. Thus, (1) an ABO(H) and Lewis secretor develops a polysaccharide antigen, Le^b, on his red cells, rather than the polysaccharide Le^a; cells Le(a−b+); (2) a secretor of Le^a but not of ABO (H) develops Le^a on the red cells; cells Le(a+b−); (3) a non-secretor of Le^a develops neither Le^a nor Le^b on his red cells regardless of his ABO(H) secretor status; cells Le(a−b−). In Caucasians this third group is rare.

The antibodies, anti-Le^a and anti-Le^b, defining the presence of these substances in secretions or on cells are not well standardized, although the reactions of anti-Le^a are clear-cut in good sera. In most studies only anti-Le^a has been used, and the tests have been confined to the red cells. Practically all Indians and Eskimos investigated have proved to be Le(a−) and ABO(H) secretors and have been assumed to fall into class 1 above. It is possible, however, that they may fall into class 3, but no studies of the presence or absence of Le^a in their saliva have been reported.

The ABO(H) secretor system is governed by a pair of allelic genes, dominant *Sec* and recessive *sec*, the inheritance of which is independent of the ABO system itself. The polysaccharides so controlled are generally termed A, B, and H, rather than A, B, and O, for reasons which we need not go into here. As we have said, they reach their highest concentration in the mucous secretions; because of its ready availability, saliva is used when testing for their presence. A group A person who carries the gene *Sec* produces A and H polysaccharides; such a group B person, B and H; an AB person, A, B, and H, and an O person, H only. Their presence in the saliva is proved by the ability of the saliva to neutralize the appropriate serum, i.e. anti-A, anti-B, or anti-H. The seeds of the plant *Ulex europaeus* contain an anti-H-like substance or lectin, an extract of the seeds being commonly used as the anti-H in secretor studies. While theoretically anti-H may be used for all salivas, it is best to confine its use to group O, since the amount of H in the saliva of some of the other groups may be very small.

The Diego System

Whether time proves that the antigen Di^a is part of a separate system, as indicated by the above name, or an allele of an already known one, possibly Kell, it has already proved to be of great interest. It is the first blood group antigen that appears to be absent from Caucasoids and Negroids and present in Mongoloids. It was first found in Venezuelan Indians and has now been shown through the studies of Layrisse and Arends (13) to be present in all but one of the tribes of Venezuelan Indians studied. Junqueira, Wishart, Ottensooser, Pasqualin, Loureiro Fernandez, and Kalmus (14) found it to be present in two tribes of Indians in Brazil. We ourselves have found it in Chippewa, Cree, and Blood Indians; Allen

(15) in Penobscots, and Pollitzer (16) in Cherokees. In the two Brazilian tribes the percentage of Di(a+) was 36 and 46 per cent, and in one tribe of Caribe Indians in Venezuela 35.6 per cent; in the remaining tribes the frequency ran around 5 to 10 per cent. It is 5 to 10 per cent in Japanese and Chinese so far studied. Colbourne, Ikin, Mourant, Lehman, and Thein (17) have found it in Land Dyaks of Sarawak. Simmons (18) tested Eastern Polynesians, Australian Aboriginese, Eastern Papuans, and natives of New Britain without finding it, while we found it to be absent in 222 Eskimos of the eastern Arctic.

The apparent absence of Di^a in Eskimos came as a surprise to us, for it seemed at first to be a Mongoloid marker gene. Further thought suggests that we may have a hint here of the separate origins of the Indians and Eskimos. Here we have the Indians who are apparently in large part Mongoloid derivatives and have this Mongoloid marker and yet do not have the characteristic *B* gene of the Mongoloids, and the Eskimos who are more Mongoloid in appearance, do have Mongoloid *B*, but not this apparently Mongoloid Di^a. Now there are two basic things we do not know about blood group genes: how the alleles arose, and, having arisen, how they attained the peculiar heights they have. We assume that at any locus there was at first—and we do not know how far back "at first" was, or just what "at first" means—a single gene; all bearers of that gene were homozygous for it. Then by mutation an allele developed. But having developed, it would not, unassisted, increase in frequency. It would have to be assisted by selection or by chance, by so-called drift. In the case of the *ABO* genes we must then assume that one of them—or some other that has disappeared or that we are not aware of—was the basic or "wild" gene and that the others arose from it by mutation. It is commonly guessed that *O* is the wild gene and *B* a mutant. Judging by its distribution, it would seem probable that the point of origin of *B* was in midwestern Asia. We guess, and it is no more than a guess, that its bearers in its youth gained some advantage over those who lacked it; perhaps it protected them to some degree from some disease endemic in the area, just as sickle-cell hæmoglobin today offers its bearers some protection against malaria. Under such a circumstance it would multiply, surviving under conditions in which *not-B* perished. So one may imagine that several, probably many, thousands of years ago the *B* gene arose and multiplied in west central Asia. Now our information about the distribution of Di^a outside the Americas is scant, but, just as any good anthropologist can construct a man from a few bits of bone, so may we hazard a guess here and construct a "locus of origin and dissemination" for Di^a in southeastern Asia, far removed from the place where *B* developed and grew. Very well. According to Collins (19) there is some archæological evidence suggesting a connection between the Eskimos and a culture around Lake Baikal, and further evidence possibly connecting this culture with a culture on the east slope of the Ural mountains. Accepting these hints, we may then imagine the Eskimos as originating in northwest Asia or in the Eurasian twilight zone, at a time when the *B* gene had already reached this area, and then travelling north and east, carrying with them the *B* gene but being far too far north and west to pick up the Di^a gene. For the Indians we would have to see them originating in southeast Asia and moving out, north by west, at an early date, carrying the Di^a gene but moving ahead

TABLE III

BLOOD GROUP GENE OR ANTIGEN FREQUENCIES DEALING WITH THE THREE GREAT SUBDIVISIONS OF MAN AND THE NORTH AMERICAN INDIANS AND ESKIMOS

	Caucasoid	Negroid	Mongoloid	Indian	Eskimo
ABO System					
Frequency of A*..........	20–30%	10–20%	15–40%	0–60%	7–40%
Ratio A_2/A_1..............	1:10–3:10	About 4:10	0	0	0
Frequency of *B*...........	5–20%	5–25%	10–30%	0	0–10%
MN System					
Frequency of *N*...........	30–50%	40–60%	35–50%	10–20%	10–20%
Frequency of *MS*.........	20–30 (25)†	7–25 (10)	5–30 (5)	15–35	6–20
Frequency of *Ms*..........	30–40 (30)	30–50 (40)	35–55 (50)	35–70	55–60
Frequency of *NS*..........	5–10 (6)	3–12 (7)	2–20 (4)	0–7	0?
Frequency of *Ns*..........	30–40 (39)	20–60 (43)	20–40 (36)	4–23	20–40
Frequency of *He*..........	0	2–12 (7)	0?	0?	0?
P System					
Frequency of P+.........	About 75%	About 90%	About 50%	About 80%	About 50%
Rh System					
Frequency of *r* (*cde*).......	40%	25%	0	0	0
Frequency of R_0 (*cDe*).....	10%	40–80%	10%	?1%	?1%
Frequency of D^u**........	Low	High	Absent	Absent	Absent
Frequency of C^w..........	About 2%	0	0	0	0
Frequency of V+.........	Rare	Common	?	?	?
Duffy System					
Common phenotype.......	Fy(a+b+)	Fy(a−b−)	Fy(a+b−)	Fy(a+b−)	Fy(a+b−)
Kell System					
Frequency of *K*...........	5%	0.2–5%	0	0	0
Lutheran System					
Frequency of Lu^a.........	4%	0.0–4%	0	0	0
Lewis System					
Frequency of Le (a+).....	22%	23%	10–15%	0	0
Frequency of Le (a−b−)..	5%	25%	?	0?	0?
Kidd System					
Frequency of Jk^a........	50%	75%	30%	35–75%	?
Diego System					
Frequency of Di (a+).....	0	0	5–10%	0–40% (10)	0?
Secretor System					
Frequency of *Sec*..........	50%	50%	100%	100%	?

*A letter in italics indicates a gene: not in italics a phenotype.
†Figure in brackets indicates most frequent frequency about which the others cluster.
**D^u is not an exact quantity; its apparent frequency depends on the sera used and the method.

NOTE: Antigens reported in Caucasoids only:

C^w, C^x, C^u, c^v, E^w, E^u all of the Rh system. Only C^w has an appreciable frequency.

Negroids only: He, Hu, S^u all of the MN system.

Mongoloids only: Di^a. The systematic position of Di^a is not clear.

of the *B* gene as it flowed east from its "locus of origin and dissemination." Just how early this would have to be we do not know; the earliest present dating in America for what may have been Indian ancestors is around 25,000 years ago, for Eskimos around 3,000 years. It is quite evident that we need more information about the distribution of Di^a and that such information may either buttress or undermine this tentative hypothesis. We are at the moment planning to extend our own observations to the western Canadian Arctic.*

Conclusions

Man's inheritance is assumed to be governed by several thousand genes. The blood group genes mark but a few widely scattered points on the almost uncharted gene map, and yet those few do begin to show forth patterns characterizing the three great populations, the Caucasoid, Negroid, and Mongoloid. Boyd in 1950 drew up a first genetic classification based on some of the blood group genes, the secretor gene and the "taster gene." Omitting the last and using only the blood group genes and secretor gene we have in Table III repeated a portion of Boyd's classification and added to it some of the newer evidence.

From this Table it appears that the Indian and Eskimo pattern is closer to the Mongoloid than to the other great divisions but that each has an individuality that sets it somewhat apart. It is not a sharply focused picture, not a close-pointed survey, yet it is surprisingly clearly defined considering how few points out of the theoretical thousands have been used in the delineation. The picture is bound to become sharper in time as other genes such as those for the hæmoglobins and the blood protein fractions are studied in population genetics and still other, simply-inherited genes come to light.

It may be seen that in Caucasians there are many small variations in the Rh locus that do not appear in the Negroids or Mongoloids, and in the Negroids there are variations in the MN locus that do not appear in the others. No locus of high variability has been found in Mongoloids. We think this is a matter of chance. More recent knowledge of the existence and structure of the blood groups has resulted from three things: the elucidation of a malady of the newborn called hæmolytic disease which is caused by antibodies; the enormous expansion of the use of transfusion in medical practice, which calls for better and better methods for the detection of antibodies; the development of highly qualified reference and research laboratories such as those of Race, Sanger, Mourant, and Morgan, at the Lister Institute in London, and that of Levine in Raritan, New Jersey. Antibodies are likely to be found then where medical service is most highly developed and to be studied in detail where a few scientists have the training, opportunity, interest, enthusiasm, and imagination for the work. These conditions have been met chiefly in Britain and the United States, and as a consequence the two populations that have been most studied both extensively and intensively have been Caucasoids and Negroids. We have not the slightest doubt that when as much work is devoted to Mongoloids, many new antibodies and antigens will come to light; the discovery of anti-Di^a by Layrisse is but a case in point. It is just eighteen years since the first evidence for the Rh system was obtained. Six of the ten known blood group systems have been discovered in the last thirteen years. In another ten years our definition of the races of man on a strictly genetic basis may be expected to attain refinements that but yesterday appeared impossible.

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*Since this was written, we have sampled the Copper Eskimos of the Coronation Gulf area without finding Di^a.

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THE HISTORIC POSITION OF THE PROTO-CREE TEXTILES IN THE EASTERN FABRIC COMPLEX, AN ETHNOLOGICAL-ARCHÆOLOGICAL CORRELATION

By Carol King Rachlin

During 1952–3, Dr. R. S. MacNeish excavated material in southeastern Manitoba which he has assigned to the Selkirk focus (beginning 1350 —). This he identifies as prehistoric and protohistoric Cree. Ethnologically, we know the Cree to be an Algonkian-speaking people of the northern Great Lakes area. In view of my work with the other Algonkian and Siouan peoples of the Great Lakes and with prehistoric textiles from east-central United States, Dr. MacNeish felt it would be worth while to have me examine the proto-Cree material that he excavated for the National Museum of Canada. Upon its examination when I came to Ottawa last autumn, it proved to be unique in one very important respect: In my attempts to get a continuous textile series from modern tribes into the archæological data, my efforts were obstructed by lack of material from the crucial protohistoric period. As a result, we have been lacking 'bridge material' to join the historic with the prehistoric data.

This material throws light on certain questions raised by Dr. MacNeish (1954–5) in his recent "Summary of Archæological Investigations in Southeastern Manitoba," which will become apparent in the course of the following analysis. Such questions as Asiatic connections and migrations, the length of residence of the Algonkian vs. Siouan peoples in Manitoba, and southern relationships of Manitoba cultures are involved.

The conclusions I am about to draw are based on a very limited collection of about fifty potsherds that had textile impressions clear enough to be analysed. The textile impressions themselves were adequate for identification of broad technical features. With these technical features as a basis, which are the same as we find in the historic tribes of the Great Lakes, we have considered the Canadian Cree in terms of the over-all Algonkian fabric complex. What is the relation of this complex to that of the Siouan peoples? In view of the Algonkian Cree and Siouan Assiniboine people in Manitoba, this question becomes significant. Farther south, Siouan and Algonkian peoples share a common weaving complex. As we go back into the archæological horizons in this area, it appears that mingling of peoples has occurred repeatedly. Even in the early Archaic period before the Christian Era, the mingling of two diverse physical types is clearly to be seen.[1]

In order to trace all these complex relationships of cultures and weaves I have prepared a chart in which the data have been co-ordinated. In this chart, the Cree material is included in the category called Algonkian. The weaving techniques of the Cree are classified in the following account as twining and simple weaving. Historically, this places them within the

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[1] For the archaic period Neumann has recognized two physically diverse peoples, the Iswanid or southern population of Indian Knoll Focus of the lower Ohio River and the Otamid group which dominated the region from Minnesota to the Atlantic Ocean (Neumann in *Archeology of the Eastern United States*, pp. 15–17).

THE HISTORIC POSITION OF FABRICS IN EASTERN UNITED STATES

CULTURE TYPES

	woodland base						woodland base		
	MODERN	PROTO-HISTORIC	MISSISS-IPPIAN.	SPIRO	OHIO HOPEWELL	ADENA	RED OCHRE PHASE	BAUMER	ARCHAIC
DATES	1900AD.	1900A.D. 1600A.D.	1600 A.D. 1200A.D.	1400 A.D. 1200 A.D.	400A.D. 300B.C.	700B.C. 400 B.C.	700B.C.	700B.C.	Pop. Pop.
PHYSICAL TYPES.			Dolichocephalic people. Brachycephalic people. Mixed Dolichocephalic & Brachycephalic people.			Brachycephalic people.			Iswanid Otamid
LINGUISTIC TYPES.	ALGONQUIAN. SIOUAN.								
SUBSISTANCE.	HORTICULTURE GATHERING.			HUNTING.	FISHING.		HUNTING.	FISHING.	
POTTERY TYPES.					All Variants of the Woodland Ceramic Complex of Baumer Type Pottery.				
CULTURAL RELATIONSHIPS.			Ceremonial Elements and Artifacts.	and Artifacts.	Mounds.	Artifacts.			Artifacts.
FABRIC RELATIONSHIPS.	Common Techniques: Twining, Weaving and Plaiting. (Braiding.)								

note:
pr. ≡ pair.
Grp. ≡ Group.
br. ≡ braid.
wrp. ≡ warp.
dgn. ≡ design.

FABRIC CONSTRUCTIONS

note:
pr. = present.
abs. = absent.
dom. = dominent.

	MODERN	PROTO-HISTORIC	MISSISS-IPPIAN.	SPIRO	OHIO HOPEWELL	ADENA	RED OCHRE PHASE	BAUMER	ARCHAIC
① TWINING.	pr.	pr.	pr.	pr.	pr.	pr.	pr.	pr.	abs.
A. PLAIN TWINING.	pr.	pr.	pr.	pr.	pr.	pr.	abs.	abs.	abs.
1. Spaced Wefts.	pr.	unknown	pr.	pr.	pr.	pr.	abs.	abs.	abs.
a. Overlaid Warps.	pr.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
b. Fully twisted Warp pairs.	abs.	unknown	abs.	pr.	abs.	abs.	abs.	abs.	abs.
2. Grouped Wefts.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
a. 1 Group=2Weft rows.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
b. 1 Group=3Weft rows.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
c. 1 Group=2Weft rows, alternated with 1 Weft row.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
d. 1 Group=3Weft rows, alternated with 1 Group of 2 Weft rows.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
3. Close Wefts.	pr.	unknown	abs.	pr.	pr.	pr.	pr.	abs.	abs.
B. Diverted Warp Twining.	pr.	unknown	pr.	pr.	abs.	pr.	abs	abs	abs
1. alternated pr. Warps.	pr.	unknown	pr.	pr.	pr.	pr.	abs.	abs.	abs.
a. Spaced Wefts.	abs.	unknown	pr.	pr.	pr.	pr.	abs.	abs.	abs.
b. Grouped Wefts.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
b-1. Each Grp. holds Warp pr.	abs.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
c. Close Wefts.	pr.	unknown	abs.	abs.	abs.	pr.	abs.	abs.	abs.
2. Twilled Warps-grp.1-4wrp.	pr.	unknown	abs.	abs.	pr.	pr.	abs.	abs.	abs.
a. Spaced Wefts.	abs.	unknown	abs.	abs.	pr.	pr.	abs.	abs.	abs.
b. Grouped Wefts.	pr.	unknown	abs.	abs.	abs.	abs.	abs.	abs.	abs.
C. Interlocking diverted Wrps.	pr.	unknown	pr.	pr.	abs.	abs.	abs.	abs.	abs.
D. Warp Medicine Bag Technic.	pr.	unknown	abs.	abs.	abs.	abs.	abs.	abs.	abs.
② Weaving.	pr.	pr.	pr.	abs.	pr.	pr.	abs.	abs.	abs.
A. Plain.	pr.	unknown	pr.	abs.	abs.	abs.	abs.	pr.	abs.
1. Warp Faced.	pr.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.
2. Weft Faced.	pr.	unknown	pr.	abs.	abs.	abs.	abs.	pr.	abs.
B. Twilled.	pr.	unknown	abs.	abs.	pr.	pr.	abs.	abs.	abs.
③ Plaiting (br.)	pr.	unknown	pr.	pr.	pr.	pr.	pr.	abs.	abs.
A. Plain	pr.	unknown	abs.	pr.	abs.	pr.	pr.	abs.	abs.
1. Wrps. diver. over-1 und-1.	pr.	unknown	abs.	pr.	abs.	pr.	abs.	abs.	abs.
2. Wrps. diver. over-2 und-2.	abs.	unknown	abs.	abs.	abs.	pr.	abs.	abs.	abs.
B. Twilled.	pr.	unknown	pr.	abs.	abs.	pr.	abs.	abs.	abs.
C. Plaiting to-produce dgn. with holes.	abs.	unknown	pr.	pr.	abs.	abs.	abs.	abs.	abs.
④ Special Technological Traits.									
A. Twist of wefts used in twine construction.									
1. "S." Twist.	dom.	pr.	dom.	dom.	dom.	dom.	pr.	dom.	abs.
2. "Z." Twist	pr.	unknown	abs.	pr.	pr.	pr.	pr.	pr.	abs.
3. Alternate rows of "S." & "Z." twist.	pr.	unknown	abs.	pr.	abs.	pr.	pr.	abs.	abs.
a. Used with plain close twine.	pr.	unknown	abs.	pr.	abs.	pr.	pr.	abs.	abs.
b. Used with twilled close twine.	abs.	unknown		abs.	abs.	abs.	abs.	abs.	abs.
B. Initial fastening of the warps.	pr.	unknown	pr.	abs.	abs.	abs.	abs.	abs.	abs.

general weaving complex of the more southern Algonkian and Siouan peoples. The chart that follows will make these questions clearer.

The chart has two main sections which co-ordinate with one another; the upper section deals with the cultures and their elements, and the lower portion with the detailed classification of the weaves. Horizontally at the top of the chart, the culture types are arranged in chronological order, the most recent being at the left. Each of these culture types is at the head of a vertical column. Along the left-hand side of the page, the descriptive characteristics of the cultures are listed from the top down, viz. physical type, linguistic type, subsistence, pottery, cultural relationships, fabric relationships. Horizontally across the page, each of these characteristics is designated by a type name in the appropriate culture column, the names being those in current use in the literature. All the descriptive characteristics of a single culture may be noted by reading the column pertaining to that particular culture. If, for instance, in the study of pottery we move horizontally across the chart, we can see the succession of pottery types, arranged in chronological order from historic through prehistoric cultures.

The last item or cultural characteristic, the fabric types, has been analysed in detail in the lower part of the chart. Down the left-hand side of the page are the basic fabric constructions—twining, weaving, and plaiting. Listed under each of these categories are subdivisions which represent variations of the basic techniques.

A fourth main category appears at the bottom of the page in the left-hand column. These are special technological fabric traits, viz. the initial fastening of the warps and the twist of the twining stitch.

The presence, absence, or dominance of each of these traits is noted horizontally under each culture column. With the exception of the protohistoric Manitoba Cree material here being considered, the other items under protohistoric are marked 'unknown.'

ACKNOWLEDGMENTS

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Regarding the textile techniques, I consulted Mr. Junius B. Bird of the American Museum of Natural History, New York City.

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CLASSIFICATION OF FABRIC TECHNIQUES

Before proceeding with the body of the paper, I would like to discuss the nature of the data and the classification of the fabric techniques.

The data for the historic Algonkian and eastern Siouan-speaking peoples are derived from my field work with the Fox of Iowa, the Chippewa of Red, Cass, and Nett lakes, in Minnesota, and the Winnebago of Wisconsin Dells, in Wisconsin. In addition, museum specimens of the following Algonkian and Siouan peoples were studied: *Algonkian:* Potowatomee, Menominee, Kickapoo, Peoria, and Cree of Manitoba, Canada; *Siouan:* Ponca, Omaha, Iowa, Osage, and Quapaw. The archæological data are derived from the literature and from my own research.

By contrast with the higher cultures of Middle and South Americas, no looms were present among the historic peoples, and there is no evidence for their presence in the archæological cultures. All these techniques are products of finger weaving.

The classification of the fabrics that resulted from my field work with the Great Lakes tribes is based upon two factors—(1), structural differences in the techniques, and (2), the element of the fabric, viz. the warp, or weft, that was predominantly emphasized by the weaver.

The main mechanical characteristics of twining are two wefts carried simultaneously in and out among the warps and twisted around each other so that the rear weft is pulled forward and the front weft is pushed behind as they progress from warp to warp.[1]

Weaving is characterized by the carrying of one weft in and out among the warps.

In plaiting or braiding, the warps themselves are interlaced without insertion of any weft element.

During the process of manufacturing the fabrics I am treating of here, the weaver placed the emphasis in twining mainly upon the warp element and its manipulation, the weft being a simple binder. The weaver gave her special attention to the manipulation of either the warp or the weft, depending upon the type of fabric desired, producing either a warp-faced or a weft-faced fabric. Since only warp elements are involved, the subdivisions of plaiting (braiding) have to be made on a different basis from the twining and weaving. In this fabric, one of the warp cords is diverted in such a way that it can be carried in and out among the remaining warps. The subdivisions have been made according to the number of warps that pass over and under the diverted warp.

With these weaving classifications as a basis, I will now consider the problem of the continuity of the historic with the prehistoric fabric complex in eastern United States.

Historic Fabrics. Twining, weaving, and plaiting—the three basic fabric constructions—are present in the historic Algonkian and Siouan cultures. Of these, twining has the greatest historical significance and will receive most of our attention.

The twining technique used for the complicated fabrics of the modern cultures is compounded of many of the variations shown on the chart under separate headings.

Though some twining variants are shared between the historic and prehistoric cultures, others are found only in the historic. One such technique is designated on the chart as warp medicine-bag technique and appears to have developed after A.D. 1600. It is a complicated variation of diverted warp twining.

Combined technical features, such as plain twining with spaced wefts, the basic element of the historic weave, appear separately and are found in all prehistoric cultures except the early Red Ochre Phase and Baumer. Diverted warp twining, another technical feature of the historic combination, is found as a technological isolate only in the prehistoric Mississippi, Spiro, and Adena cultures.

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[1] Weltfish, Gene. The origins of art, p. 257. The Bobbs Merrill Company, Inc. New York, 1953.

PLATE I

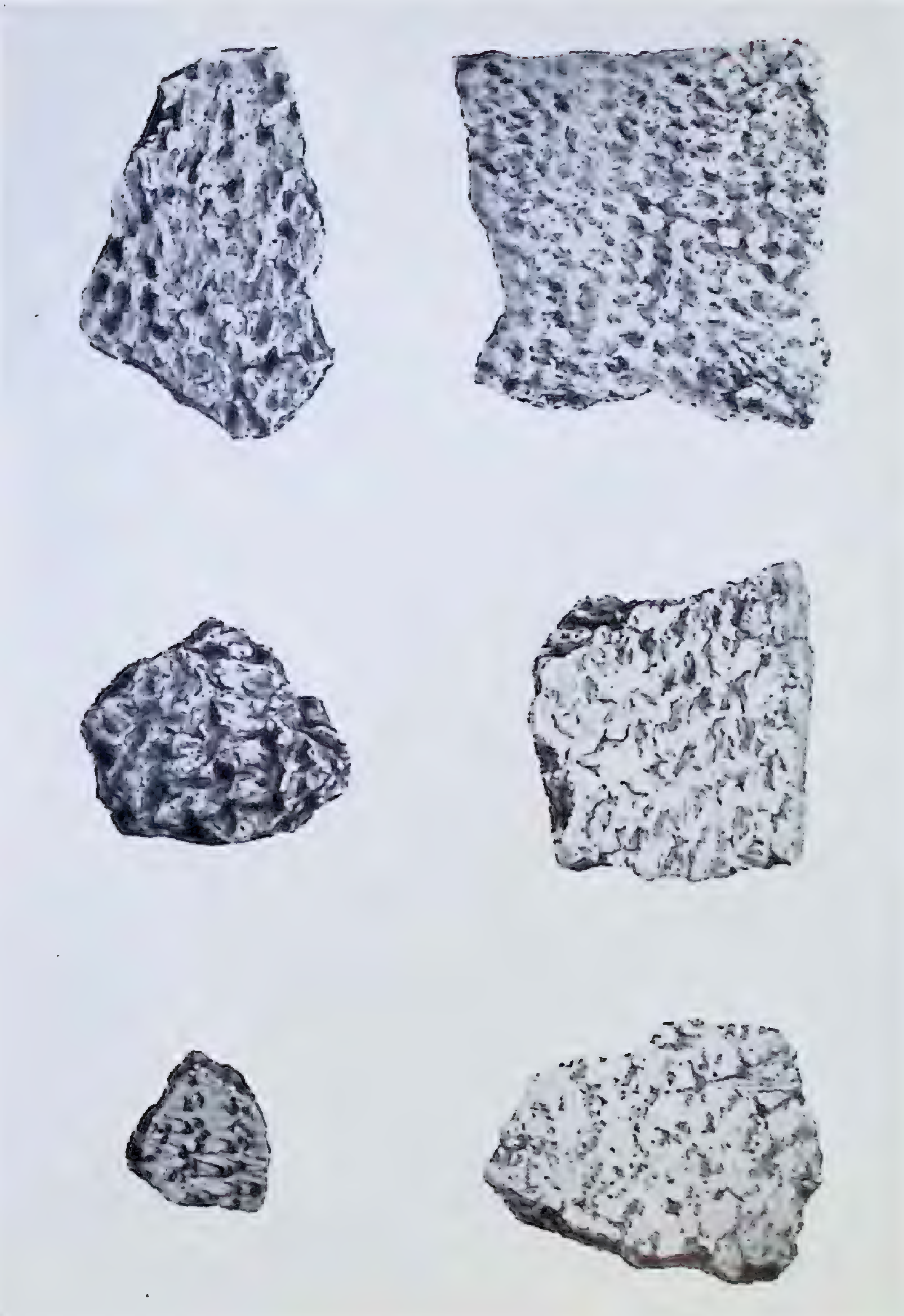

Fig. 1. A Selkirk Focus sherd showing impressions of plain twining that have been paddled against the pot.

Fig. 2. 4. Selkirk Focus sherds showing impressions of plain twining that have been laid against the pot, perhaps to assist in maintaining its form during manufacture.

Fig. 3. Selkirk Focus plain twining impressed sherd showing the 'S'-twisted wefts.

Fig. 5, 6. Anderson Focus Knotted net-impressed sherds showing 'Z'-twisted elements.

A special technological feature of twining, which has historical importance, is the direction of the twist of the twined stitch. The Algonkian and Siouan peoples usually twist the wefts away from the weaver, forming an S-twisted stitch, although the principle of twisting the wefts toward the weaver, resulting in a Z-twisted stitch is known. When we do find Z-twisted stitches, however, they are always found in association with S-twisted stitches in alternate rows. This combination of stitches has often been referred to in the archæological literature as "chevron" twining and is found in the fabrics of the Spiro, Adena, and Red Ochre Phase cultures.

I cannot at the present time make a similar detailed historical comparison of weaving and plaiting because they have not as yet been analysed and charted to the same degree as the twined weaves. Moreover, their variations are not so readily defined as in twining, and they do not give as clear historical results. However, one or both of these basic constructions have been recorded for all the archæological fabric complexes.

Prehistoric Fabrics. The nuclear area for the prehistoric fabrics in the eastern United States was in the Ohio, Illinois, and adjacent Mississippi River valleys. This was the area where the Hopewell-Adena cultures flourished and at a later period the Mississippian culture.

The three basic fabric constructions, twining, weaving, and plaiting, are found fully developed in the Adena-Hopewell cultures and continue, with very little change, through the prehistoric period. The Adena-Hopewell fabrics, which might be considered homogeneous except for certain preferences in technique and quality, were the base upon which the subsequent fabric complexes of the Mississippi-Spiro cultures were founded.

What then is the relationship between Hopewell and Adena in terms of fabrics? At this time we have too little information about the Hopewell textiles to make any positive statements. It seems to me, however, that in Ohio, the centre of the Hopewell culture, the fabric complex was predominantly fine texture-twining with very little use being made of weaving or plaiting. The Adena people, on the other hand, preferred coarser twined fabrics and practiced a great deal of weaving and plaiting.

If additional research proves my observations to be correct, these preferences for techniques may indicate either that (1) the diverse origins of the Adena and Hopewell cultures whose fabric techniques mingled when the cultures were crystallized in the area, or that (2) the three basic constructions, twining, weaving, and plaiting, were already present in the area prior to the arrival of the Adena-Hopewell people and were adopted to different degrees by both.

Glenn A. Black has stated in the *Walam Olum Legend*: "Adena has a background at variance with Hopewell, which is attested not only by material traits but by physical characteristics as well. The items which make them seem alike are the 'high church' traits of Hopewell, these being found in both complexes."[1]

Relationships between the Adena-Hopewell and two other cultures have been suggested, viz. the Archaic whose subsistence pattern was hunting and fishing by contrast with the more advanced horticultural Hopewell-Adena, and early Woodland which resembled the Archaic with the addition of pottery.[1]

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[1] Black, Glenn A. An archæological consideration of the Walam Olum. *In* Walum Olum or Red Score. The Migration Legend of Lenne Lenape or Delaware Indians. Published by the Indiana Historical Society, Indianapolis, Ind., p. 328. 1951.

Relationship between Archaic and Adena-Hopewell has been suggested by Webb and Baby on the basis of burial customs and artifacts.[2] Black states: "That there can be no doubt that Woodland and Hopewell are related".[3]

Early Woodland relationship has been suggested by Griffin on the basis of an early Adena variant of the Woodland ceramic complex in the Ohio Valley; the name of this early Adena pottery type is Fayette Thick. Its other Early Woodland pottery relatives are Baumer, Marion Thick, and Early Crab Orchard of the Illinois variety, and Vinette I of the Great Lakes and New York area.[4]

We have no evidence of fabrics until after the Archaic period. In early Woodland times, weaving and twining appear fully developed as shown by textile impressions on Baumer focus pottery excavated at Kincaid Site. Beyond this general finding with relation to Woodland textiles, special regional or sequential data are lacking owing to incompleteness of analysis.

Wilder has shown that in the Baumer focus at Kincaid, weaving predominated, with twining being used only as a method of binding.[5] The weaving is of the weft-faced variety. This textile evidence is not sufficiently distinctive to construct cultural relationships.

Another group of early fabrics that must be considered are those excavated from the rock shelters and caves in Ohio and Kentucky (*See* Note 1). These fabrics can be identified as Adena on the basis of a distinctive characteristic of the weave, viz. the twining together of plaited warps which appear to be an Adena type feature.[6] To my knowledge this technique was not used by the Ohio-Hopewell peoples. 'Chevron twining' is also characteristic of these rock shelter fabrics.[7]

We have confirmatory evidence of their Adena identity in the associated pottery. This belongs to the Red Ochre Phase of the Adena Aspect.

On the basis of Adena fabrics, we are unable to differentiate between early, middle, and late Adena. Perhaps an analysis of Adena fabrics from sites dated by other cultural evidences will reveal an Adena fabric sequence.

From the Middle Woodland period on, there is little doubt that the peoples of Eastern United States shared a common fabric tradition. This tradition derived from the Ohio Hopewell-Adena cultures.

For the Mississippian culture, which dominated the area after Adena-Hopewell, we have a much more complete picture (Griffin, 1938, 1939, 1942; Lewis and Kneberg, 1944; Wilder, 1951; Rachlin, 1956). Our evi-

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NOTE 1. Ash Canter's, Kettle Hill caves in Ohio, and the Buckner, Day, Red-Eye, Steve De Hart, and New Kash Hollow shelter, and Salts and Mammoth caves in Kentucky.

[1] Griffin, J. B. The ceramic affiliations of the Ohio Valley Adena Culture. *In* The Adena People, by W. S. Webb and C. E. Snow. Univ. of Kentucky Repts. in Anthrop. and Archæol., Vol. VI, p. 226. Lexington, Ky. Sept. 1945.

[2] Webb, W. S., and R. S. Baby. The Adena People No. 2. Published by The Ohio Hist. Soc., pp. 113-114. 1957.

[3] Black, G. A. An archæological consideration of the Walam Olum. *In* Walum Olum or Red Score. The Migration Legend of Lenne Lenape or Delaware Indians. Published by Ind. Hist. Soc., Indianapolis, Ind., p. 329. 1954.

[4] Griffin, J. B. Some early and Middle Woodland types in Illinois. *In* Hopewellian Communities in Illinois by Thorne Deuel, p. 98. Published by State of Illinois; Springfield, Ill. 1952.

[5] Wilder, Charles G. *Kincaid Textiles;* Published in Kincaid: A Prehistoric Illinois Metropolis. By Fay-Cooper Cole pp. 366-76. The University of Chicago Press, 1951.

[6] Miner, Horace. The importance of textiles in the archæology in the Eastern United States. Am. Antiquity. Jan. Vol. I, No. 3. 1936.

[7] *Ibid.*

dence is derived from fabric-impressed pottery. Twining is the principal fabric construction used by the Mississippi peoples; although weaving was known, it was not very often impressed upon the pottery. These twined fabrics appear to have reached their highest development in the Tennessee-Cumberland region. The base for these Mississippian fabric techniques is the twined fabric complex of the Ohio Hopewell culture which was present in the Ohio, Mississippi, and Illinois valleys prior to the arrival of the Mississippian tradition in the area. It is possible that within the Mississippian culture the indigenous peoples of the region did the weaving and the new culture brought in ideas that gave rise to two new weaves—the interlocking diverted warp technique and the complicated braiding technique. With the decline of the Mississippian culture, the fabric complex reverted to its original Hopewell base.

The most complicated and least understood of all the prehistoric fabric complexes in the Eastern United States is that of the Spiro Mound Culture. The relationship of this culture to the Mississippian Culture is not clearly understood. However, it shared with the Mississippian fabric tradition the basic twining techniques, the interlocking diverted warp technique and the complicated plaiting technique in which the designs are produced by openwork. In addition to the techniques which Spiro shared with the Mississippian Culture, it shared still other techniques with the Adena and historic cultures; these were the 'chevron' twined weave, e.g. a weft-faced technique with 'S'- and 'Z'-twisted stitches[1], and a simple plaiting technique. It will require considerable further research to clarify the position of Spiro to the preceding Adena Culture, to the contemporary Mississippian Culture, and to the following Historic cultures.

Owing to a lack of data for the crucial protohistoric period, there is a serious gap in our knowledge between the late prehistoric cultures and the historic. This is because—(1) we lack museum specimens before 1850; (2) European specimens have not been studied from an ethnohistorical point of view; (3) description of fabrics which appear in the literature have not been interpreted so that they can be used for the reconstruction of culture history (*See* Note 2).

Because of this lack of continuity with the protohistoric cultures, the historic Algonkian and eastern Siouan fabrics cannot be identified with the archæological. Twining, weaving, and plaiting, the three basic fabric constructions, are all practised by the Algonkian and eastern Siouan peoples, and they are also present in the archæological cultures. The historic peoples have the same 'chevron' twine and plaiting techniques as the prehistoric, Spiro, and Adena cultures. Their twining techniques are the same as those of the Ohio-Hopewell peoples. Two special technological features that appear in twined fabrics are shared by historic and prehistoric peoples:

(1) 'S'-twisted stitches. These are present from the earliest fabric until the present time. Where 'Z' twist is used, it occurs only in alternate rows, producing a characteristic 'chevron' effect. Weltfish has pointed out, "It is common for expert basket-making tribes to use

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NOTE 2. We have only one exception to this statement at the present time—the protohistoric Cree material excavated by MacNeish in southeastern Manitoba.

[1] Hamilton, Henry W. The Spiro Mound, Pl. 140, p. 264, Columbia, Mo. 1952.

only one of these spiral twists to the exclusion of the other."[1] We may assume therefore, that 'S'-twisted or upward-leaning stitches, in which the weaver twists the wefts away from the body, was the basic motor habit of the area and that 'Z'-twisted downward-leaning stitches were used only as a technological device to produce a particular design or texture effect. The use of the same motor habit for 2,600 years within the same geographical area, in which five different cultures have flourished, has great historical significance.

(2) Initial fastening of warps by twining to set them in place is the same for historic and prehistoric Mississippian peoples. The historical significance of this method cannot be determined, but the uniqueness within this area of the procedure suggests a continuation of the prehistoric tradition into the historic period.

Peripheral Areas. To the north and east of the nuclear area, our data are less complete but equally significant. The major technique is twining, generally of a coarse texture as compared with nuclear area twining. Numbers of variations on the basic twining theme that we find in the nuclear area are lacking in the peripheries.

The pottery upon which these impressions are found is all of the widely-distributed Woodland type. The distribution extends from Illinois in the west to the Atlantic slope in the east, from the Great Lakes in the north to Virginia in the south. The fabric-impressed examples show cord marking, twining, and weaving. It ranges in time from early Woodland to the protohistoric Cree period, where we find it in southeastern Manitoba. The proto-Cree textile impressions are typical of the general peripheral technical style—coarse-twined and woven fabrics (*See* Plate I). The peripheral areas are related to the nuclear area in the presence of the general techniques which are common to both of them, viz. twining and weaving. But in each case they are of less refined varieties. From the general culture complexes in the respective groups, it would seem that, compared with the nuclear area, the peripheral peoples had a considerably greater struggle for subsistence. This, in turn, means that the time and specialization needed for finer workmanship were not available. All these data indicate that the movement of the Cree was originally from the south northward and that the Cree textile-marked pottery here is not of direct Asiatic derivation. Of the relation of the Siouan Assiniboine and Algonkian Cree, we can only infer that on the basis of other Siouan and Algonkian groups in the historic material of the Great Lakes tribes, their fabric complexes can well be homogeneous so that we cannot determine from the fabric techniques alone which group would be responsible. However, the pottery on which the textiles are impressed is an independent historical feature, and from this source and other cultural manifestations, we may derive further light on the question of origin.

Archæologically, as to the general significance of the characteristic textile pattern of the peripheral regions compared with that of the nuclear area, it may be that the special innovations of the Mississippi-Spiro cultures were never diffused. In this case, the pattern in the peripheral areas would represent a long continuity reaching back directly into the Adena-Hopewell past.

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[1] Weltfish, Gene. The origins of art, p. 261, Indianapolis, Ind. 1953.

The consideration of the protohistoric Cree material of southeastern Manitoba, in the light of the weaving complexes of the historic peoples and archæological culture of eastern North America, leads to certain important historical conclusions.

First, that the protohistoric Cree textile complex has a long history in eastern North America. *Second*, that its derivation is most likely from the south, where it points directly to the textile complexes of the archæological sites in the Ohio, Illinois, and Mississippi river valleys. *Third*, as a representative of the peripheral type of archæological material in the general region, it is likely that it represents a long-continuing 'subsistence culture' rather than a deteriorated manifestation of the higher prehistoric eastern cultures.

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NOTES ON MISTASSINI PHONEMICS AND MORPHOLOGY

By Jean H. Rogers[1]

The following linguistic material was gathered during thirteen months' ethnographic field work with my husband in 1953 and 1954 among the Mistassini Indians in south-central Quebec. The report consists of a descriptive presentation of material gathered during four months' work with a bilingual informant, Mrs. Wilfrid Jefferys, at the Mistassini Post, augmented by a limited amount of data secured in nine months with a monolingual family on their hunting lands. Considerable time was spent in an attempt to learn the Mistassini dialect, but this, although successful to a limited degree, was not sufficient to provide a secure basis for analysing the more elaborate aspects of the morphology and syntax.

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I. MISTASSINI PHONEMES

1.0 THE PHONEMES

Mistassini phonemes are of two types: consonants and vowels. Stress differences are slight and nonphonemic, and the position of the strongest stress in the word varies freely. There is a tendency, however, for a weak stress to appear on the final syllable, except in words ending in short vowels.

Consonants include four types: stops /p t k/ and the affricate /c/, spirants /s h/, nasals /m n/, and semi-vowels /w y/.

Vowels occur in normal and short length: normal /i e a u o[2]/, and short /ɪ ʌ ᴜ/.

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[1] Albuquerque, New Mexico.

[2] Subsequent work indicates that the phoneme /o/ is actually, in most cases, the sequence /wa/. The Mistassini vowel system thus conforms to the ordinary Cree vowel system of four long and three short vowels as given by Leonard Bloomfield in Harry Hoijer and others, *Linguistic Structures of Native America* (Viking Fund Publications in Anthropology, No. 6), New York, 1946, pp. 85–129.

2.0 DESCRIPTION OF PHONEMES

2.1 Consonants

Affricate and stops /p t c k/ fluctuate freely as either voiced or unaspirated voiceless between voiced vowels, but are always voiceless elsewhere. They are bilabial, alveolar, alveo-palatal, and velar in position.

Spirants /s h/ are always voiceless. /s/ fluctuates between alveo-palatal and a position slightly forward of alveo-palatal, but is never retroflex. /h/ is a glottal fricative.

Nasals /m n/ sometimes occur voiceless before a voiceless vowel but are always voiced elsewhere. They are bilabial and alveolar continuants.

Semi-vowels /w y/ are voiceless before voiceless vowels, voiced elsewhere. They are bilabial and palatal in position.

2.2 Vowels

Normal vowels /i e a u o/ are voiced in all environments. /i/ high front close unrounded syllabic vocoid. /e/ mid front unrounded syllabic vocoid, fluctuating between open and close. /a/ low central open unrounded syllabic vocoid, backed after /w/. /u/ back rounded syllabic vocoid fluctuating between high close and mid close position. /o/ mid back open rounded syllabic vocoid, slightly raised and close after /w/.

Short vowels /ɪ ᴀ ᴜ/ are phonetically shorter than the normal, and voiceless in utterance final and before spirants. These vowels are subject to further subphonemic variation in combination with other phonemes (*see* 2.3). /ɪ/ optionally rounded before /w/, elsewhere a front open unrounded vocoid, fluctuating between high and mid position. It is syllabic except in special environments listed under 2.3. /ᴀ/ mid central unrounded vocoid fluctuating between open and close, syllabic except in special environments listed under 2.3. /ᴜ/ back rounded vocoid, fluctuating between high open and mid close positions, always syllabic.

2.3 Phonetic variations in special combinations of phonemes

There is free fluctuation between /wu/ and /u/, /wo/ and /o/, in all environments where /ẇ/ is permitted. /wutᴀ/ *here;* /wopᴜs/ rabbit. In the absence of other (e.g. morphophonemic) data, the longer form is standardized in the phonemic writing.

Sequences /pɪm/, /pᴀm/, /tɪn/, and /tᴀn/ are usually phonetically reduced to a nasally released stop plus nasal. /*pɪm*i/ *fat*, n; /wa*pᴀm*ew/ *he sees him*; /ᴀst*ᴜtɪn*/ *hat;* /kᴀ*tᴀn*ɪkᴜhtew/ *he will chop wood.*

Word initially, /nɪ/ plus stop, affricate or /n/ is phonetically a syllabic nasal. /*nɪt*ut/ *my canoe*; /*nɪc*ɪkᴜ/ *otter*; /*nɪn*ɪpan/ *I sleep.*

Before spirants and following certain consonants, /ɪ/ and /ᴀ/ are usually zeroed in normal speech. The zeroing is most likely to occur when the preceding syllable is voiced and the short vowel is followed by a single consonant rather than a cluster.

/ɪ/ and /ᴀ/ occurring after stops and before spirants are usually zeroed when both consonants in the sequence have similar points of articulation. The sequences involved are /tɪs/, /tᴀs/, /cɪs/, /cᴀs/, and /kᴀh/. (*kɪ and *ki have become /cɪ and /ci/ in Mistassini, so that the sequence /kɪh/ does not occur. /ki/ occurs in my data only in two words which represent borrowings.) /nɪ*t*ɪskutew/ *my fire;* /nɪ*t*ᴀsam/ *my snowshoe;* /cɪsɪt/ *your foot*; /wᴀcᴀskᴜ/ *muskrat*; /sa*k*ᴀ*h*ikᴀn/ *lake.*

/ɪ/ and /ᴀ/ occurring after spirants and nasals and before spirants are usually zeroed, especially when the sequence appears before a vowel. /sakᴀhikᴀ*n*ɪsɪs/ *pond*; /pɪ*m*ɪsɪn/ *lie down.*; /pe*m*ɪ*h*at/ *he flew*, subordinate.

It will be noticed that in most of the sequences listed the phonemes /ɪ/ and /ᴀ/ will usually be phonetically indistinguishable. If all such sequences are not carefully checked, a residue of doubtful forms will result. In such cases, I have written the doubtful vowel as V. /pi*mVh*ᴜ/ *wind it;* /mᴀsɪ*nVh*ikᴀn/ *book, writing.*

3.0 DISTRIBUTION OF PHONEMES

3.1 Distribution of consonants

All consonants occur word initially and finally. Two-consonant clusters are restricted to several types: spirant plus stop or affricate occurring word medially and finally; nasal plus stop or affricate occurring word medially; stop plus semi-vowel occurring word initally and medially; nasal plus semi-vowel occurring word medially. Three-consonant clusters are restricted to one type, occurring word medially: spirant plus stop plus semi-vowel.

Spirant plus stop. All possibilities occur word medially: /ᴀ*sp*ᴀp/ *sit down on it*; /ᴀ*st*akwᴜn/ *evergreen bough*; /ᴀ*sc*ɪy/ *earth*; /es*k*ᴀn/ *chisel*; /ᴀkᴜ*hp*ᴀ/ *garments;* /wapᴀ*ht*ᴀm/ *he sees it;* /mɪ*hc*en/ *many;* /mɪ*hk*ᴜ/ *blood.* All possibilities except /sp/ occur word finally: /ina*st*/ *balsam fir*; /niso*sc*/ *seven*; /intapana*sk*/ *toboggan*; /ᴀkᴜ*hp*/ *garment*; /mɪ*ht*/ *stick of firewood*; /ᴀscɪhkᴜ*hc*/ *in the pot*; /ka tᴀkᴜsɪ*hk*/ *when he came.*

Nasal plus stop. This cluster, occurring medially only, is restricted to homorganic combinations: /ta*nt*e/ *where?*; /ᴀ*nc*is/ *now*; /cɪ*mp*ᴜtakᴀn/ *saw*, n.

Stop plus semi-vowel. This cluster occurs only with /kw/: /*kw*esko/ *it (inanimate) is straight*; /ᴀsta*kw*ᴜn/ *evergreen bough.*

Nasal plus semi-vowel. Like the preceding nasal plus stop cluster, this one is restricted to homorganic combinations: /*mw*estatew/ *he's lonesome for her*; /nɪcɪseyɪ*ny*ᴜn/ *I am old.*

Spirant plus stop plus semi-vowel. Subject to the same restriction as stop plus semi-vowel, the three-consonant clusters include /skw/ and /hkw/: wᴀ*skw*ey/ *birch*; /ɪ*hkw*ᴀc/ *lice.*

3.2 Distribution of vowels

All vowels occur word initially, medially, and finally. There are no vowel clusters.

4.0 SYLLABLE STRUCTURE

The analysis of syllable structure is based primarily on distributional criteria.

4.1 Syllable types involving single vowels and consonants

Short vowels, when subject to phonetic variations, are sometimes affected by the preceding consonant, but always affected by the following

consonant. I have assumed, therefore, that single consonants following short vowels, or for the sake of symmetry, any vowels, belong to the syllable of the preceding vowel.
V /e/ *while*, particle; CV /ka/ *when*, particle; VC /ut/ *canoe*; CVC /wʌw/ *egg*.

4.2 Syllable types involving consonant clusters

The analysis with regard to consonant clusters is based on the occurrences of clusters in the word. Stop plus semi-vowel /kw/ and nasal plus semi-vowel /mw/ occur word initially and, therefore, syllable initially; spirant plus stop occurs finally and, therefore, syllable finally. CCVC /mwec/ *before;* CCVCC /mwestatew/ (mwest-at-ew) *he's lonesome for her;* CCV /sta/ *put it down;* VCC /ʌkʊhp/ (ʌk-ʊhp) *garment;* CVCC /suhk/ *hard, strongly.*

Two types of consonant cluster occur word medially only: nasal plus stop, and the three-consonant cluster spirant plus stop plus semi-vowel. Where these clusters occur, a syllable division is assumed to exist between the consonants: /tante/ (tan-te) *where.* The placement of the syllable division in a three-consonant cluster is entirely arbitrary: /ɪhkwʌc/ (ɪhk-wʌc) *lice.*

5.0 MORPHOPHONEMIC CHANGES

5.1 Augmentation

Augmentation between consonants: an augment /ɪ/ is inserted between a morpheme ending in a consonant and a morpheme beginning with a consonant. /tʌkʊsɪn/ *he comes* plus /-yɪw/ (*obviative*) becomes /tʌkʊsɪnɪyɪw/ *he* (*obviative*) *comes.* The augment is omitted in certain cases of nasal plus stop: / wacɪnakʌn/ *larch* plus /-tʌkʊ/ *dead wood* becomes /wacɪnakʌntʌkʊ/ *dead larchwood.*

Augmentation between vowels: if one or both vowels are front /i ɪ e/, an augment /y/ is inserted. /-ʊtɪnen/ *take it* (with first person singular suffix) plus /nɪ-/ *first person singular* plus /kʌ-/ *future* becomes /nɪwiyʊtɪnen/ *I want to take it;* /-itʊwen/ *say it* (with first person singular suffix) plus /nɪ-/ *first person singular* plus /kʌ-/ *future* becomes /nɪkʌyitʊwen/ *I will say it.* If neither is a front vowel and one or both are back /u ʊ o/, an augment /w/ is inserted. /-ʊtɪnen/ *take it* (with first person singular suffix) plus /nɪ-/ *first person singular* plus /kʌ/ *future* becomes /nɪkʌwʊtinen/ *I will take it.*

5.2 Reduction

If both vowels are central vowels /a ʌ/, one vowel, /ʌ/ if it occurs is omitted. /apʌtɪsɪw/ *he works* plus /mɪstʌ-/ *large, greatly* becomes /mɪstapʌtɪsɪw/ *he works hard;* /ʌsɪnɪy/ *stone* plus /mɪstʌ-/ *large, greatly* becomes /mɪstʌsɪnɪy/ *great stone,* the origin of the name Mistassini; /-ʌpɪn/ *sit down* (with first person singular suffix) plus /nɪ-/ *first person singular* plus /kʌ-/ *future* becomes /nɪkʌpɪn/ *I will sit down;* /-apʌtɪsɪn/ *work* (with first person singular suffix) plus /nɪ-/ *first person singular* plus /pa-/ *potential* becomes /nɪpapʌtɪsɪn/ *I could work.*

5.3 Compulsory alternation of phonemes

When a morpheme ending in /ᴜ/ combines with a morpheme beginning with a vowel, /ᴜ/ becomes /w/ where the occurrence of /w/ is permitted. /ᴀtɪhkᴜ/ *caribou* plus /-ᴀc/ *plural suffix* (animate) becomes /ᴀtɪhkwᴀc/ *caribou*, pl.

Morpheme final /k/ becomes /c/ before a front vowel. /suhk/ *hard, strongly* plus normal augment /-ɪ-/ plus /-sɪw/ *animate verbal suffix* becomes /suhcɪsɪw/ *he's strong;* /naskanɪw/ *one puts down boughs*, but /nascew/ *he, she puts down boughs.*

There is an unpredictable alternation between /t/ and /c/ in some diminutives and certain other cases. /ᴀtɪmᴜ/ *dog* plus /-sɪs/ *diminutive* becomes /ᴀcɪmᴜsɪs/ *puppy;* /ᴀtɪhkᴜ/ *caribou* plus /-sɪs/ *diminutive* becomes /ᴀcɪhkᴜsɪs/ *young caribou;* /natᴀkwewᴀc/ *they look at rabbit snares*, /natᴀhipewᴀc/ *they look at a fish net*, but /nacɪwenɪhicewᴀc/ *they look at traps*, /nacɪkᴜscewᴀc/ *they look at set lines;* /nɪmamanasten/ *I gather evergeen boughs* and /nɪpɪmpayɪhtan/ *I run an outboard motor* become /nɪmamanascen/ and/nɪpɪmpayɪhcan/, nicknames for dogs.

II. NOTES ON MORPHOLOGY

The Mistassini dialect contains three word classes: verbs, nouns, and particles. Verbs and nouns are inflected; particles are uninflected. Verbs, nouns, and particles may be derived, derived verbs and nouns then being inflected like simple forms of the same word classes. The morphological section does not deal with derivations, however, since not enough time was available for an analysis of the complex derivational system. The section is divided into two parts: Verb Inflection and Noun Inflection.

In general, words belonging to different word classes are subject to different inflections. Exceptions include the interrogative and vocative inflections. The interrogative suffix,/-a/ after C, /-ha/ after V, is added to words of any word class. The suffix is added to the word about which the speaker wishes to ask. Emphasis on the verb: /cɪciwepɪnen-a ᴀsɪnɪy nete/ "Did you *throw* the stone over there?"; emphasis on the noun: /cɪciwepɪnen ᴀsɪnɪy-a nete/ "Did you throw the *stone* over there?"; emphasis on the particle: /cɪciwepɪnen ᴀsɪnɪy nete-ha/ "Did you throw the stone *over there*?"

Names or nicknames for people and animals, and other animate nouns such as /ᴀwasɪs/ "child," /ᴀcɪmᴜsɪs/ "puppy," may be inflected in address by /-hᴀ/ after vowels, /-ᴀ/ varying freely with /-e/ after consonants. The vocative suffix is, however, optional: /ᴀcɪmᴜsɪs/ or /ᴀcɪmᴜsɪs-ᴀ/ or /ᴀcɪmᴜsɪs-e/ "puppy!"; /loli/ or /loli-hA/ "Lolly!" The same suffix appears optionally with verbs in the Imperative Order: /(eka) /tut-ᴀ/ ("don't) do that!" For extra emphasis, two vocative suffixes may be appended: /pit-ᴀ-hᴀ (eka) tut-ᴀ-hᴀ/ "Pete, (don't) do that!"

A. VERB INFLECTION

1.0 INTRODUCTION

Although sufficient data for a complete analysis of verb morphology were not collected, the major outline of the structural scheme of verb inflection is clear. In the charts and paradigms which follow, question marks indicate points where data are lacking.

1.1 Major verb types

On the basis of their occurrence with inflectional affixes, four major types of verbs can be distinguished. These are Inanimate Intransitive (in. intrans.), Animate Intransitive (an. intrans.), Transitive Inanimate (trans. in.), and Transitive Animate (trans. an.). Intransitive verbs are distinguished according to the gender (animate or inanimate) of the subject; transitive verbs are distinguished according to the gender of the object.

Within each major verb type, various stem classes exist. Each stem class in a given verb type is characterized by the stem-final phoneme or phoneme sequence, which, in some cases, undergoes changes for different inflections. In addition, inflectional suffixes sometimes differ among the stem classes of the same verb type. Stem classes among the major verb types are as follows: in. intrans. stems, class 1: -C, class 2: -o, class 3: -V other than o; an. intrans. stems, class 1: -n, class 2: -o, class 3: -ᴜ, class 4: -V other than o or ᴜ; trans. in. stems, class 1: -e; trans. an. stems, class 1: -a, class 2: -o, class 3: -ᴀᴡᴀ. These classes are determined from the 3rd person form of the in. intrans., and from the 1st person of the remaining verb types.

1.2 The paradigmatic scheme

Paradigmatic sets of inflections are characteristic of each major verb type. Verbs are inflected for the person, number, and gender of the subject (intransitive verbs) or the object (transitive verbs). First, second, third, and fourth obviative persons are distinguished. The fourth obviative person is used in reference to any person or thing mentioned after a third animate person. Singular and plural number are distinguished, with the distinction of exclusive and inclusive 1st person plural. Animate and inanimate genders are distinguished for 3rd and 4th person subjects and objects.

Inanimate Intransitive Verbs

Inflections for in. intrans. verbs refer only to 3rd and 4th obviative person inanimate singular and plural subjects.

Animate Intransitive Verbs

Inflections for an. intrans. verbs refer to 1st, 2nd, 3rd, and 4th obviative person animate singular and plural subjects.

Transitive Inanimate Verbs

Inflections for trans. in. verbs occur in two sets, according to the person, 3rd or 4th obviative, of the object, which is always inanimate. In the first set, the object is in 3rd person, and the subjects, always animate, are distinguished for person (1st and 2nd) and number. In the second set, the object is in 4th obviative person, and the subjects are distinguished for person (1st, 2nd, 3rd) and number. There are no inflections for an inanimate subject acting on an inanimate object.

Transitive Animate Verbs

Inflections for trans. an. verbs occur in six related sets. In the first set, a 2nd person acts on a 1st person, subject and object being distinguished for singular and plural number; this paradigm is designated 1A. In the second set, a 1st person acts on a 2nd (paradigm 1B). In the third set, a 1st or 2nd person acts on a 3rd person animate object (paradigm 2A). In the fourth set a 3rd person (an. or in.) acts on a 1st or 2nd (paradigm 2B). Inflections in this set are distinguished according to the gender of the subject. In the fifth set, a 1st, 2nd, or 3rd animate person acts on a 4th animate person (paradigm 3A). (Note that the rule of obviation does not permit an inanimate 3rd person subject acting upon an animate 4th person object.) In the sixth set, 4th obviative person (an. or in.) acts on 1st, 2nd, or 3rd animate person (paradigm 3B). As in paradigm 2B, inflections differ for an inanimate or animate 4th obviative person subject.

1.3 Inflectional orders

The inflections of verbs of the major types outlined above fall into three orders. These are the Independent Order, with inflections for ordinary declarative statements; the Subordinate Order, with inflections for verbs in subordinate clauses; and the Imperative Order, with inflections for verbs of command. In any one order the inflections show similarities for the various major verb types while the inflections of the three orders are quite different from one another. The inflectional scheme outlined above is characteristic of each order, although the degree to which each theoretically possible paradigm is filled varies for the different orders. For example, in the Imperative Order, inflections for trans. an. verbs occur only for 2nd person subjects in set 1A, and for 1st person plural inclusive and 2nd person subjects in sets 2A and 3A.

In addition to the pronominal affixes characteristic for each order, there are inflections for tense, aspect, and mode in the Independent Order, and tense-aspect particles as well as inflections for modes in the Subordinate Order.

1.4 Special derivations

There appears to be a rather complex derivational system which accounts for similarities among related sets of verbs in the major verb types. Not enough data were collected, however, to make possible a systematic analysis of the derivational system. Certain special derivations are clear, however. These include the derivation of passive verbs (an. intrans.) from trans. an. and trans. in. stems; the derivation of nonpersonal verbs (in. intrans.) from an. intrans. stems; the derivation of impersonal verbs (an. intrans. and in. intrans.) from trans. in. stems; and the derivation of reflexive and reciprocal verbs (an. intrans.) from trans. an. stems. In all cases, the stems for passive, nonpersonal, impersonal, reflexive, and reciprocal verbs are formed by the addition of derivational suffixes.

2.0 INFLECTIONS

2.1 Independent Order

The Independent Order is characterized by a set of pronominal suffixes similar among the major verb types, the use of pronominal prefixes for 1st and 2nd person subjects and, in transitive verbs, objects, and the use of tense, aspect, and mode affixes.

Inanimate Intransitive Verbs

The stems of the three in. intrans. stem classes do not undergo change, but the inflections differ slightly for each stem class.

Pronominal Inflections

Subjects:	3S	w,	-(zero) in classes 1 and 2
	3P	ᴀw,	-ᴀ in class 1
	4S	yɪw	
	4P	yɪw	

Stem class 1: /ᴀsihtɪn-/ *to be dull*: /ᴀsihtɪn-(zero)/ *it's dull*; /ᴀsihtɪn-ᴀ/ *they're dull.* Stem class 2: /pɪheko-/ *to be thick*: /pɪheko-(zero)/ *it's thick*; /pɪheko-yɪw/ *it, they (4) is, are thick.* Stem class 3: /astᴀwe-/ *to go out:* /astᴀwe-w/ *it goes out (a light or fire).*

Animate Intransitive Verbs

The stems of the four an. intrans. stem classes do not undergo change, but the inflections differ slightly for each stem class.

As indicated above, prefixes occur for 1st and 2nd person subjects: nɪ- varying with nɪt- before V for 1S, 1Pe; cɪ- varying with cɪt- before V for 1Pi, 2S and 2P. A few unpredictable exceptions occur in which nɪ- occurs as n- before ᴜ and u, and cɪ- occurs in the same verbs as k-: /n-ᴜtamVhᴜ-n/ *I hit*, /k-ᴜtamVhᴜ-n/ *you (S) hit.*

Pronominal Inflections

Subjects:	1S	nɪ-	-n,	-(zero) in class 1
	1Pe	nɪ-	-nan,	-an in class 1
	1Pi	cɪ-	-nanᴀw,	-anᴀw in class 1
	2S	cɪ-	-n,	-(zero) in class 1
	2P	cɪ-	-nawᴀw,	-awᴀw in class 1
	3S		-w,	-(zero) in classes 1 and 2
	3P		-wᴀc,	-ᴀc in class 1
	4S		-yɪw	
	4P		-yɪwᴀc	

Stem class 1: /pɪmɪsɪn-/ *to lie down*: /nɪ-pɪmɪsɪn-(zero)/ *I lie down*; /cɪ-pɪmɪsɪn-anᴀw/ *we (incl.) lie down.* Stem class 2: /pihto-/ *to smoke*: /cɪ-pihto-nawᴀw/ *you (P) smoke*; /pihto-(zero)/ *he smokes.* Stem class 3: /micɪsᴜ-/ *to eat*: /cɪ-micɪsᴜ-n/ *you (S) eat;* /micɪsᴜ-yɪw/ *he (4) eats.* Stem class 4: /nɪpa-/ *to sleep*: /nɪpa-wᴀc/ *they sleep*; /nɪpa-yɪwᴀc/ *they (4) sleep.*

Transitive Inanimate Verbs

Only one stem type occurs for transitive inanimate verbs, stems ending in -e. This vowel becomes -A before the suffixes which refer to an obviative object (*see* Set II below).

Pronominal Inflections

Set I

Objects: 3rd S and P in.

Subjects:	1S	nI-	-n
	1Pe	nI-	-nan
	1Pi	cI-	-nanAW
	2S	cI-	-n
	2P	cI-	-naWAW

Stem class 1: /wapAhte-/ *to see it*: /nI-wapAhte-nan/ *we* (*excl.*) *see it, them*; /cI-wapAhte-n/ *you* (*S*) *see it, them.*

Set II

Objects: 4th obviative S and P in.

Subjects:	1S	-mon
	1Pe	-monan
	1Pi	-monanAW
	2S	-mon
	2P	-monaWAW
	3S	-m
	3P	-mWAC

Stem class 1: /wapAhte-/ *to see it*: /cI-wapAhtA-monanAW/ *we* (*incl.*) *see it, them* (*4*); /wapAhtA-m/ *he* (*3*) *sees it, them* (*4*); /wepIne-/ *to throw it away*: /cI-wepInA-mon/ *you* (*S*) *throw it, them* (*4*) *away*; /wepInA-mWAC/ *they* (*3*) *throw it, them* (*4*) *away.*

Transitive Animate Verbs

Stem changes among the three stem classes are most easily described in relation to the six inflectional sets in which transitive animate verbs occur.

Stem Classes

	1: -a	2: -O	3: AWA
Inflectional Sets—			
1A	-I	-U	-AWI
1B	-I	-U	-a
2A	-a	-O	-AWA
2B	-I	-U	-a
3A	-e (3 subj.)	-Uwe (3 subj.)	-Awe (3 subj.) -a (1 and 2 subj.)
3B	-I	-U	-a

Pronominal Inflections

The relationship between the inflectional sets is most clearly illustrated by the pronominal inflections of the Independent Order. In Sets 1A, 2A, and 3A, a 1st or 2nd person subject is represented by a prefix. In Sets 1B, 2B, and 3B, a 1st or 2nd person object is represented by the prefix. In addition, in Sets 1B, 2B, and 3B a theme sign (-tɪ for 1B, -kʊ for 2B and 3B) is added to the stem before the pronominal suffix.

Set 1A

	Objects:	1S		1Pe	
Subjects:	2S	cɪ-	-n	cɪ-	-nan
	2P	cɪ-	-naᴡʌᴡ	cɪ-	-nan

Stem class 1: /wapʌma-/ *to see him:* /cɪ-wapʌmɪ-n/ *you* (*S*) *see me.* Stem class 2: /ʊtamVho-/ *to hit him:*/k-ʊtamVhʊ-nan/ *you* (*S or P*) *hit us.* Stem class 3: /pehtʌᴡʌ-/ *to hear him:* /cɪ-pehtʌᴡɪ-naᴡʌᴡ/ *you* (*P*) *hear me.*

Set 1B (Theme sign: -tɪ)

	Subjects:	1S		1Pe	
Objects:	2S	cɪ-	-n	cɪ-	-nan
	2P	cɪ-	-naᴡʌᴡ	cɪ-	-nan

Stem class 1: /wapʌma-/ *to see him:*/cɪ-wapʌmɪ-tɪ-nan/ *we* (*excl.*) *see you* (*S or P*). Stem class 2: /ʊtamVho-/ *to hit him:* /k-ʊtamVhʊ-tɪ-n/ *I hit you* (*S*). Stem class 3: /pehtʌᴡʌ-/ *to hear him:* /cɪ-pehta-tɪ-naᴡʌᴡ/ *I hear you* (*P*).

Set 2A

	Objects:	3S an.		3P an.	
Subjects:	1S	nɪ-	-ᴡ, -(zero) in stem class 2	nɪ-	-ᴡʌc
	1Pe	nɪ-	-nan	nɪ-	-nanʌc
	1Pi	cɪ-	-nʌᴡ	cɪ-	-nʌᴡʌc
	2S	cɪ-	-ᴡ, -(zero) in stem class 2	cɪ-	-ᴡʌc
	2P	cɪ-	-ᴡʌᴡ	cɪ-	-ᴡʌᴡʌc

Stem class 1: /wapʌma-/ *to see him:* /nɪ-wapʌma-ᴡʌc/ *I see them;* /cɪ-wapʌma-ᴡ/ *you* (*S*) *see him.* Stem class 2: /ʊtamVho-/ *to hit him:* /k-ʊtamVho-(zero)/ *you* (*S*) *hit him;* /k-ʊtamVho-ᴡʌᴡʌc/ *you* (*P*) *hit them.* Stem class 3: /pehtʌᴡʌ-/ *to hear him:* /nɪ-pehtʌᴡʌ-ᴡ/ *I hear him;* /nɪ-pehtʌᴡʌ-ᴡʌc/ *I hear them.*

Set 2B (Theme sign: -kʊ)

	Subjects:	3S an.		3P an.		3S and P in.	
Objects:	1S	nɪ-	-(zero)	nɪ-	-ʌc	nɪ-	-n
	1Pe	nɪ-	-nan	nɪ-	-nanʌc	nɪ-	-nan
	1Pi	cɪ-	-nʌᴡ	cɪ-	-nʌᴡʌc	cɪ-	-nanʌᴡ
	2S	cɪ-	-(zero)	cɪ-	-ʌc	cɪ-	-n
	2P	cɪ-	-ᴡʌᴡ	cɪ-	-ᴡʌᴡʌc	cɪ-	-naᴡʌᴡ

Stem class 1: /wapʌma-/ *to see him:* /nɪ-wapʌmɪ-kʊ-(zero)/ *he sees me;* /nɪ-wapʌmɪ-kʊ-nanʌc/ *they see us* (*excl.*). Stem class 2: /ʊtamVho-/ *to hit him:* /n-ʊtamVhʊ-kʊ-n/ *it hits me;* /k-ʊtamVhʊ-kʊ-ᴡʌᴡ/ *he hits you* (*P*). Stem class 3: /pehtʌᴡʌ-/ *to hear him:* /cɪ-pehta-kʊ-nʌᴡ/ *he hears us* (*incl.*); /cɪ-pehta-kᴡ-ʌc/ *they hear you* (*S*).

Set 3A

Objects: 4S and P an.

Subjects:	1S	nɪ-	-yɪᴡ(ᴀ)[1]
	1Pe	nɪ-	-nan(ᴀ)
	1Pi	cɪ-	-nᴀᴡ
	2S	cɪ-	-yɪᴡ(ᴀ)
	2P	cɪ-	-ᴡᴀᴡ
	3S an.		-ᴡ
	3P an.		-ᴡᴀᴄ

Stem class 1: /wapᴀma-/ *to see him:* /nɪ-wapᴀma-ʏɪᴡ(ᴀ)/ *I see him, them (4);* /wapᴀme-ᴡ/ *he (3) sees him, them (4).* Stem class 2: /ᴜtamVho-/ *to hit him:* /k-ᴜtamVhᴜ-ᴡᴀᴡ/ *you (P) hit him, them (4);* /ᴜtamVhᴜwe-ᴡᴀᴄ/ *they (3) hit him, them (4).* Stem class 3: /pehtᴀᴡᴀ-/ *to hear him:* /nɪ-pehtanan(ᴀ)/ *we (excl.) hear him, them (4);* /pehtᴀwe-ᴡ/ *he hears him, them (4).*

Set 3B (Theme sign: -kᴜ)

	Subjects:	4S and P an.		4S and P in.	
Objects:	1S	nɪ-	-yɪᴡ(ᴀ)	nɪ-	-wan
	1Pe	nɪ-	-nan(ᴀ)	nɪ-	-wanan
	1Pi	cɪ-	-nᴀᴡ	cɪ-	-wananᴀᴡ
	2S	cɪ-	-yɪᴡ(ᴀ)	cɪ-	-wan
	2P	cɪ-	-ᴡᴀᴡ	cɪ-	-wanaᴡᴀᴡ
	3S an.		-ᴡ		-ᴡ
	3P an.		-ᴡᴀᴄ		-ᴡᴀᴄ

Stem class 1: /wapᴀma-/ *to see him:* /nɪ-wapᴀmɪ-kᴜ-yɪᴡ(ᴀ)/ *he, they (4) see me;* /cɪ-wapᴀmɪ-kᴜ-ᴡᴀᴡ/ *he, they (4) see you (P).* Stem class 2: /ᴜtamVho-/ *to hit him:* /ᴜtamVhᴜ-kᴜ-ᴡ/ *he, it, they (4) (an. or in.) hit him (3);* /k-ᴜtamVhᴜ-kᴜ-wan/ *it, they (4) hit you (S).* Stem class 3: /pehtᴀᴡᴀ-/ *to hear him:* /cɪ-pehta-kᴜ-nᴀᴡ/ *he, they (4) hear you (P);* /pehta-kᴜ-ᴡᴀᴄ/ *he, it, they (4, an. or in.) hear them (3 an.).*

2.11 Inflections for tense, aspect, and mode in the independent order.

The listing of tenses, aspects, and especially modes is probably incomplete. More extensive field data would undoubtedly uncover additional categories.

Tenses, aspects, and modes appear to be used with any of the major verb types.

Tense

In the Independent Order, tense is indicated by prefixes of the third order counting from the stem. These prefixes follow the pronominal prefix in 1st and 2nd person. They are mutually exclusive.

Present tense. (zero)-: /yutɪn-/ *to be windy* (in. intrans.): /(zero)-yutɪn-(zero)/ *it's windy;* /nɪpa-/ *to sleep* (an. intrans.): /nɪ-(zero)-nɪpa-n/ *I sleep;* /wapᴀhte-/ *to see it* (trans. in.): /cɪ-(zero)-wapᴀhte-n/ *you (S) see it;* /wapᴀma-/ *to see him* (trans. an.): /nɪ-(zero)-wapᴀma-w/ *I see him.*

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[1] Recorded as free variation between -yɪᴡ and -yɪᴡᴀ.

Future tense. kᴀ- in 1st and 2nd person, kᴀtᴀ- varying with cɪkᴀ- in 3rd and 4th obviative: /yutɪn-/ *to be windy* (in. intrans.): /kᴀtᴀ-yutɪn-(zero)/ or /cɪkᴀ-yutɪn-zero)/ *it will be windy:* /nɪpa-/ *to sleep* (an. intrans.): /nɪ-kᴀ-nɪpa-n/ *I will sleep;* /wapᴀma-/ *to see him* (trans. an.): /nɪ-kᴀ-wapᴀma-w/ *I will see him.*

Dubitative future. pa-, varying with cɪpa- in 3rd and 4th obviative person: /mɪyo-/ *to be good* (in. intrans.): /pa-mɪyo-(zero)/ or /cɪpa-mɪyo-(zero)/ *it would be good;* /wapᴀma-/ *to see him* (trans. an.): /nɪ-pa-wapᴀma-w/ *I might see him.*

Past. ci-: /mɪyo-/ *to be good* (in. intrans.): /ci-mɪyo-(zero)/ *it was good;* /wapᴀhte-/ *to see it* (trans. in.): /cɪ-ci-wapᴀhte-n/ *you (S) saw it.*

Mode I

Mode I, of which the desiderative is the only example in my data, is indicated by a second order prefix, following the tense prefixes.

Desiderative. wi-: /nɪpa-/ *to sleep* (an. intrans.): /nɪ-kᴀ-wi-nɪpa-n/ *I'll want to sleep;* /mowa-/ *to eat it (an.) (trans. an.):* /(zero)-wi-mowe-w/ *he, she wants to eat it (an.).*

Aspect

Aspect is indicated by first order prefixes attached to the stem.

Completive. cis-: /nɪkᴜhte-/ *to chop wood* (an. intrans.): /nɪ-kᴀ-wi-cis-ɪ-nɪkᴜhte-n/ *I'll want to finish chopping;* /pa-cis-ɪ-nɪkᴜhte-w/ *he would finish chopping.*

Emphatic. uc-: /pusɪ-/ *to embark* (an. intrans.): /nɪ-kᴀ-w-uc-ɪ-pusɪn/ *I will embark;* /wapᴀma-/ *to see him* (trans. an.): /n-uc-ɪ-wapᴀma-w/ *I do see him!*

Potential. ci-: /usɪha-/ *to make it (an.)* (trans. an.): /cɪ-kᴀ-ci-w-usɪha-w/ *you (S) will be able to make it (an.);* /wapᴀhte-/ *to see it* (trans. in.): /nɪ-pa-ci-wapᴀhte-n/ *I would be able to see it.*

Mode II

Mode II, of which the dubitative is the only example in my data, is indicated by a final suffix, following the pronominal suffixes.

Dubitative. -atᴜhce after verbs in -n: /nɪpa-/ *to sleep* (an. intrans.): /nɪ-ci-nɪpa-n/ *I slept:* /nɪ-ci-nɪpa-n-atᴜhce/ *I might have been asleep.* Verbs in -w drop the w and add -tᴜhce: /ɪtᴜhte-/ *to go* (an. intrans.): /ɪtᴜhte-w/ *he goes:* /ɪtᴜhte-tᴜhce/ *he may go;* /wapᴀma-/ *to see him* (trans. an.): /nɪ-ci-wapᴀma-w/ *I saw him:* /nɪ-ci-wapᴀma-tᴜhce/ *I might have seen him.* The dubitative suffix appears as -tᴜhcenᴀc in 3rd an. P: /nipa-/ *to sleep* (an. intrans.): /nɪpa-tᴜhcenᴀc/ *they may be asleep.*

2.2 Subordinate Order

The Subordinate Order is characterized by a set of pronominal suffixes similar for the major verb types, but quite different from the pronominal suffixes of the Independent Order. No personal prefixes are used in the Subordinate Order. Tense-aspect is indicated by characteristic particles loosely attached to the verb; and mode, by final suffixes or, in one case, by change of the first stem vowel. Examples of the pronominal inflections are given with the aorist particle /ka/.

Inanimate Intransitive Verbs

In class 1 stems where -C is -n, this is replaced by -h in 3rd person subject. I have no examples of the inflections of the Subordinate Order for in. intrans. stems of class 2. There are no changes in the stems of class 3.

Pronominal Inflections

Subjects:	3S	-c
	3P	-ko
	4S	-yɪc
	4P	-yɪc

Stem class 1: /pɪmɪhamᴀkᴀn-/ *to fly:* /ka pɪmɪhamᴀkᴀh-c/ *that which flies, airplane;* /ka pɪmɪhamᴀkᴀh-ko/ *airplanes.* Stem class 3: /mɪsa-/ *to be big:* /ka mɪsa-c/ *that which is big, the big one;* /ka mɪsa-yɪc/ *that, those (4) which is, are big.*

Animate Intransitive Verbs

In an. intrans. verbs of stem class 1, -n is replaced by -h before -k in 3rd person subject. I have no examples of an. intrans. stems of class 2 in the Subordinate. Final -ᴜ in stems of class 3 becomes -ᴜᴡɪ in 1st, 2nd, and 4th obviative person subject. No change occurs in class 4.

Pronominal Inflections

Subjects:	1S	-yan
	1Pe	-yahc
	1Pi	-yᴀhkᴜ
	2S	-yᴀn
	2P	-yekᴜ
	3S	-t, optionally -k in stem class 1
	3P	-to, optionally -ko in stem class 1
	4S	-yɪc
	4P	-yɪc

Stem class 1: /tᴀkᴜsɪn-/ *to come:* /ka tᴀkᴜsɪn-ɪ-t/ or /ka tᴀkᴜsɪh-k/ *when he came;* /ka tᴀkᴜsɪn-ɪ-yan/ *when I came.* Stem class 3: /micɪsᴜ-/ *to eat:* /ka micɪsᴜ-ᴡɪ-yᴀhkᴜ/ *when we (incl.) ate;* /ka micɪsᴜ-to/ *when they (3) ate.* Stem class 4: /nɪpa-/ *to sleep:* /ka nɪpa-yᴀn/ *when you (S) slept;* /ka nɪpa-yɪc/ *when he, they (4) slept.*

Transitive Inanimate Verbs

In the single stem class for this verb type, -e becomes -A.

Pronominal Inflections

Set I

Objects: 3rd S and P in.

Subjects:	1S	-man
	1Pe	-mahc
	1Pi	-mAhkU
	2S	-mAn
	2P	-mekU

Stem class 1: /wapAhte-/ *to see it:* /ka wapAhtA-man/ *when I saw it, them;* /ka wapAhtA-mekU/ *when you (P) saw it, them.*

Set II

Objects: 4th obviative S and P in.

Subjects:	1S	-mwAc
	1Pe	-mwAcIhtA
	1Pi	-mwAhkU
	2S	-mwAt
	2P	-mwekU
	3S	-k
	3P	-ko

Stem class 1: /wapAhte-/ *to see it:* /ka wapAhtA-mwAc/ *when I saw it, them (4);* /ka wapAhtA-k/ *when he (3) saw it, them (4).*

Transitive Animate Verbs

My data for transitive verbs cover only those of stem class 1. The following changes occur in the final vowel of the stem:

Inflectional Sets

1A	-a becomes -I in all persons
1B	-a becomes -I in all persons
2A	-a becomes -e in 2P subject, -A elsewhere
2B	-a becomes -I in all persons
3A	-a unchanged in 3S and P subjects, -e in 2P, -A elsewhere
3B	-a becomes -I in 1S object, unchanged in 3S and P object

The same system of paradigms occurs as in the Independent Order. However, my data are incomplete for the Subordinate Order, as indicated in the following by question marks. Theme signs do not occur in the Subordinate Order.

Pronominal Inflections

Set 1A

Objects:	1S		1Pe
Subjects:	2S	-yᴀn	-yahc
	2P	-yekᴜ	-yahc

Stem class 1: /wapᴀma-/ *to see him:* /ka wapᴀmɪ-yᴀn/ *when you* (*S*) *saw me;* /ka wapᴀmɪ-yahc/ *when you* (*S or P*) *saw us* (*excl.*).

Set 1B

Subjects:		1S	1Pe
Objects:	2S	-tan	-tahc
	2P	-tᴀkwᴀc	-tahc

Stem class 1: /wapᴀma-/ *to see him:* /ka wapᴀmɪ-tᴀkwᴀc/ *when I saw you* (*P*); /ka wapᴀmɪ-tahc/ *when we* (*excl.*) *saw you* (*S or P*).

Set 2A

Objects:		3S an.	3P an.
Subjects:	1S	-k	-ko
	1Pe	-cɪhtᴀ	-cɪhto
	1Pi	-hkᴜ	-hko
	2S	-t	-to
	2P	-kᴜ	-kwᴀc

Stem class 1: /wapᴀma-/ *to see him:* /ka wapᴀmᴀ-k/ *when I saw him;* /ka wapᴀmᴀ-hko/ *when we* (*incl.*) *saw them;* /ka wapᴀme-kwᴀc/ *when you* (*P*) *saw them.*

Set 2B

	Subjects:	3S an.	3P an.	3S and P in.
Objects:	1S	-t	-to	?
	1Pe	-yᴀmɪhta	-yᴀmɪhto	?
	1Pi	-tᴀhkᴜ	-tᴀhko	?
	2S	-skᴀ	-sko	?
	2P	-takᴜ	-takwᴀc	?

Stem class 1: /wapᴀma-/ *to see him:* /ka wapᴀmɪ-t/ *when he saw me;* /ka wapᴀmɪ-yᴀmɪhto/ *when they saw us* (*excl.*); /ka wapᴀmɪ-skᴀ/ *when he saw you* (*S*).

Set 3A

Objects:	4S and P an.	
Subjects:	1S	-c
	1Pe	-cɪhtᴀ
	1Pi	-hkᴜ
	2S	-t
	2P	-kᴜ
	3S an.	-t
	3P an.	-to

Stem class 1: /wapᴀma-/ *to see him:* /ka wapᴀmᴀ-c/ *when I saw him, them (4)*; /ka wapᴀme-kᴜ/ *when you (P) saw him, them (4)*; /ka wapᴀma-t/ *when he (3) saw him, them (4)*.

Set 3B

	Subjects:	4S and P an.	4S and P in.
Objects:	1S	-yɪc	?
	1Pe	?	?
	1Pi	?	?
	2S	?	?
	2P	?	?
	3S an.	-yɪc	?
	3P an.	-yɪc	?

Stem class 1: /wapᴀma-/ *to see him:* /ka wapᴀmɪ-yɪc/ *when he, they (4) saw me;* /ka wapᴀma-yɪc/ *when he, they (4) saw him, them (3).*

2.21 Inflections for tense-aspect and mode in the Subordinate Order

Subordinate verbs not formally marked for mode occur with a particle which appears to have a combined significance of tense and aspect. However, the exact usages remain somewhat obscure. Subordinate verbs formally marked for mode do not combine with particles. Much work remains to be done before subordinate verbs and their usages are thoroughly understood.

Aorist. /ka/: /tᴀkᴜsɪn-/ *to come* (an. intrans.): /(citɪpɪskaw) ka tᴀkᴜsɪn-ɪ-yahc/ *(it was dark) when we (excl.) came back*; /(tayɪspɪs) ka tᴀkᴜsɪh-k/ *(when)*[1] *did he come back?*

Future. /ce/: /tɪpɪska-/ *to be dark* (in. intrans.): /(kᴀtᴀtᴀhkayaw) ce tɪpɪska-c/ *(it will be cold) when it gets dark (or) tonight*; /tᴀkᴜsɪn-/ *to come* (an. intrans.): /(tayɪspɪs) ce tᴀkᴜsɪh-k/ *(when) will he come back?*

Static. /e/: /ɪsɪnɪkate-/ *to be called* (in. intrans.): /(tan) e ɪsɪnɪkate-c/ *(what, how) is it called?*; /pᴀpamɪska-/ *to paddle about* (an. intrans.): /(cɪwapᴀmɪtɪn) e pᴀpamɪska-yan/ *(I saw you) while I was paddling about.*

Continuative. /eci/: /ɪkᴜpepᴀyɪ-/ *to sink* (an. intrans.): /(nɪciwapᴀmaw) eci ɪkᴜpepᴀyɪ-t/ *(I saw him) when he had almost sunk.*

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[1] Interrogative words such as/tayɪspɪs/*when?*,/tante/*where?*, /eekwan/what? are particles, since they are not inflected. They can be translated as *when is it?*, *where is it?*, etc. They may be followed by nouns as, for example, /tante napᴜy/*where is my paddle?;* when followed by verbs, these are always in the Subordinate Order:/tante ce ɪtᴜhteyᴀn/*where (is it) that you will go?*

Conditional mode. /-e/, referring to events which have not yet occurred or about which there is some doubt: /tᴀkᴜsɪn-/ *to come* (an. intrans.): /ka tᴀkᴜsɪn-ɪ-yahc/ *when we* (*excl.*) *come back*: /(kᴀtᴀtɪpɪskaw) tᴀkᴜsɪn-ɪ-yahc-e/ (*it will be dark*) *when we return*; /yutɪn-/ *to be windy* (in. intrans.): /ka yutɪh-c/ *when it was windy*: /nᴀmwᴀc nɪkᴀyɪtᴜhtenan) yutɪh-c-e/ (*we won't go*) *if it's windy.*

Changed mode, referring to events of a single past occurrence, is indicated by a change in the first vowel of the stem. My examples are not complete for all vowels: ɪ becomes e; i becomes a; u becomes e; ᴀ becomes e: /pɪpᴜn-/ *to be winter* (in. intrans.): /pepᴜh-c/ *when it was winter, last winter*; /nipɪn-/ *to be summer*: /napɪh-c/ *last summer*; /usta-/ *to make it* (trans. in.): /(nᴀmeyew ute) esta-yᴀn/ (*it's not here, this way*) *that you were making it, you aren't doing it right;* /tᴀkᴜsɪn-/ *to come* (an. intrans.): /tekᴜsɪh-k/ or tekᴜsɪn-ɪ-t/ *when he arrived.*

2.3 Imperative Order

There are no imperative forms for inanimate intransitive verbs. For the other major verb types, my data include forms only for 2nd person and for 1st person inclusive plural subjects. Forms exist only for present commands; there are no tenses, aspects, or modes specific to the Imperative Order.

Animate Intransitive Verbs

For an. intrans. verbs, the imperative inflections are added to the stem with no changes for the various stem classes.

Pronominal Inflections
Subjects: 2S -(zero)
2P -kᴜ
1Pi -taw

Stem class 1: /pɪmɪsɪn-/ *to lie down*: /pɪmɪsɪn-(zero)/ *lie down*; /pɪmɪsɪn-ɪ-kᴜ/ *lie down* (*2P*). Stem class 2: /pihto-/ *to smoke*: /pihto-taw/ *let's smoke.* Stem class 3: /micɪsᴜ-/ *to eat:* /micɪsᴜ-kᴜ/ *eat* (*2P*).; /micɪsᴜ-taw/ *let's eat.* Stem class 4: /nɪpa-/ *to sleep*: /nɪpa-(zero)/ *sleep,* (*or*) *go to sleep.*

Transitive Inanimate Verbs

There is no separate inflectional paradigm for obviative objects in the imperative of transitive verbs.

The stem vowel -e becomes ᴀ.

Pronominal inflections

Objects: 3S and P in. and 4S and P in.
Subjects: 1Pi -htaw
2S -(zero)
2P -mᴜkᴜ

Stem class 1: /kᴀnowapᴀhte-/ *to look at it:* /kᴀnowapᴀhtᴀ-htaw/ *let's look at it, them*; /kᴀnowapᴀhtᴀ-(zero)/ *look at it, them.*

Transitive Animate Verbs

My data are not complete for all stem classes. Changes are as follows:

Stem Classes

	1: -a	2: -o	3: -AWA
Inflectional Sets			
1A	-I	?	-AWI
2A–3A	-(zero) in 2S -a elsewhere	-o in 2S ? elsewhere	-a in 1Pi, 2P; ? elsewhere

Pronominal Inflections

Set 1A

Objects:	1S	1Pe
Subjects: 2S	-(zero)	-nan
2P	-kU	-nan

Stem class 1: /kAnowapAma-/ *to look at him*: /kAnowapAmI-(zero)/ *look at me (2S subj.)*; /kAnowapAmI-nan/ *look at us (excl.) (2S or P subj.)*. Stem class 3: /mAsInVhAmAWA-/ *to write to him:* /mAsInVhAmAWI-kU/ *write to me (2 P subj.)*.

Set 2A-3A

Objects:		3 and 4 S an.	3 and 4 P an.
Subjects:	1Pi	-taw	-tawenAC
	2S	-(zero)	-AC
	2P	-kU	-kWAC

Stem class 1: /kAnowapAma-/ *to look at him*: /kAnowapAm-(zero)/ *look at him (2 S subj.)*; /kAnowapAma-taw/ *let's look at him.* Stem class 2: /UtamVho-/ *to hit him*: /UtamVho-(zero)/ *hit him: (2 S subj.)*; /UtamVho-W-AC/ *hit them: (2 S subj.)*. Stem class 3: /mAsInVhAmAWA-/ *to write to him*: /mAsInVhAma-taw/ *let's write to him*; /mAsInVhAma-kWAC/ *write to them*: *(2 P subj.)*.

3.0 SPECIAL DERIVATIONS

My data, although fragmentary, indicate that a derived stem is inflected in the various orders like a simple stem of the same verb type and stem class. Unless otherwise specified, examples are given for inflections in the Independent Order.

Nonpersonal Verbs

Nonpersonal verbs are derived from animate intransitive stems. Class 1 stems add -anIw; classes 2 and 3 add -nanIw. Stems of Class 4 ending in -a add -nIw, and those ending in -e undergo change to -a and add -nIw. Stems in class 4 ending in -V other than -a or -e add -nanIw. The resulting derived stems belong to the inanimate intransitive verb type, stem class 1. Nonpersonal verbs occur in my data in inflections of the Independent and the Subordinate Orders. Stem class 1: /pImIsIn-/ *to lie down*: /pImIsIn-anIw-/ : /pImIsIn-anIw-(zero)/ *there is lying down, people are lying down.* Stem class 2: /pihto-/ *to smoke*: /pihto-nanIw-/:

/pihto-nanɪw-(zero)/ *there is smoking*; / pihto-nanɪw-ɪ-c/ *while there's smoking*, Subordinate. Stem class 3: /micɪsᴜ-/ *to eat*: /micɪsᴜ-nanɪw-/: /micɪsᴜ-nanɪw-(zero)/ *there is eating; a meal is going on.* Stem class 4: /nɪpa-/ *to sleep*: /nɪpa-nɪw-/: /nɪpa-nɪw-(zero)/ *there is sleeping; everybody's asleep;* /mᴀkᴜse-/ *to feast:* /mᴀkᴜsa-nɪw-/: /mᴀkᴜsa-nɪw-(zero)/ *there is feasting; a feast is going on*; /pusɪ-/ *to embark*: /pusɪ-nanɪw-/: /pusɪ-nanɪw-(zero)/ *there is embarking; "We're off!"*

Impersonal Verbs

Impersonal verbs are derived from transitive inanimate stems. The stem final vowel -e changes to -a before the derivational suffixes -kwᴀn, forming an inanimate intransitive verb of class 1, and -kᴜsɪ, forming an animate intransitive verb of class 4. /pehte-/ *to hear it* (trans. in.): /pehta-kwᴀn-/ (in. intrans.): /pehta-kwᴀn-(zero) (ce ci-sowayac)/ *It's heard* (*that it will be mild weather*); /pehta-kᴜsɪ-/ (an. intrans.): /pehta-Kᴜsɪ-w (e akᴜsɪt)/ *he's heard, one hears him* (*that he is sick*).

Passive Verbs

Passive verbs are derived from transitive animate and transitive inanimate stems. The resulting derived stems are animate intransitive and inanimate intransitive respectively. Transitive animate stems add -kᴀᴡɪ in 1st and 2nd persons, -kᴀnɪ in 3rd and 4th obviative, and the derived animate intransitive stem belongs to class 4. Transitive inanimate stems add -kᴀnɪ to form inanimate intransitive stems of class 3.

Vowel changes occur before the addition of the derivational suffixes: trans. an. stems, class 1: -a becomes -ɪ in 1st and 2nd persons, unchanged elsewhere; class 3: -ᴀᴡᴀ becomes -a in 1st and 2nd persons, -ᴀᴡᴀ elsewhere. Trans. in. stems, class 1: -e becomes -a. Trans. an. class 1: /wapᴀma-/ *to see him*: /wapᴀmɪkᴀᴡɪ-/ *to be seen* (an. intrans.): /nɪ-wapᴀmɪ-kᴀᴡɪ-n/ *I am seen*, /wapᴀma-kᴀnɪ-w/ *he is seen*: class 3: /pehtᴀᴡᴀ-/ *to hear him*: /pehta-kᴀᴡɪ-/ *to be heard* (an. intrans.): /nɪ-pehta-kᴀᴡɪ-n/ *I am heard.* Trans. in. class 1: /pehte-/ *to hear it:* /pehta-kᴀnɪ-/ *to be heard* (trans. in.): /pehta-kᴀnɪ-w/ *it is heard.*

Reflexive and Reciprocal Verbs

Reflexive and reciprocal verbs are derived from transitive animate stems. The resulting stems are animate intransitive, class 3. Trans. an. stems add -sᴜ to form the reflexive, -tᴜ to form the reciprocal. Vowel changes occur in the stem final vowel as follows: trans. an. stems, class 1: -a becomes -ɪ; class 2: -o is unchanged. Stem class 1: /wapᴀma-/ *to see him*: /wapᴀmɪ-sᴜ-/ reflexive (an. intrans.): /nɪ-wapᴀmɪ-sᴜ-n/ *I see myself*; /wapᴀmɪ-tᴜ-/ reciprocal (an. intrans.): /wapᴀmɪ-tᴜ-ᴡᴀc/ *they see each other*; stem class 2: /ᴜtamVkᴀho-/ *to hit him with an axe*: /ᴜtamVkᴀho-sᴜ-/ reflexive (an. intrans.): /n-ᴜtamVkᴀho-sᴜ-n/ *I hit myself with an axe*; /ᴜtamVkᴀho-tᴜ-/ reciprocal (an. intrans.): /k-ᴜtamVkᴀho-tᴜ-nanᴀᴡ/ *we* (*incl.*) *hit each other with an axe.*

B. NOUN INFLECTION

1.0 INTRODUCTION

Not enough data were collected to make possible an analysis of noun derivations. The present section, therefore, omits all reference to derivational problems. Points at which inflectional data are doubtful or lacking are indicated by question marks.

Nouns are selectively classified into two basic types, animate and inanimate, characterized by different inflections. The animate gender includes all people and animals, some plants, and some non-living objects (man, dog, tree, kettle, moosehide, orange, paddle); other non-living objects and plants (lake, grass, blueberry, potato, moccasin, canoe) are inanimate.

Nouns of both genders are inflected for number (singular and plural) and obviation. When only one noun is mentioned, it is inflected for 3rd person obviative. A noun of either gender mentioned after an animate 3rd person obviative occurs in the 4th obviative inflection. There is also a further obviative, designated 5th obviative.

Animate and inanimate nouns are inflected for possession, the possessor being 1st, 2nd, 3rd, or 4th person. A noun with a 3rd person possessor is itself inflected in the 4th obviative, and, similarly, a noun with a 4th obviative possessor is in the 5th obviative.

A locative inflection is used with possessed and unpossessed nouns of both genders. Animate nouns, apparently in the singular only, are inflected for address. The vocative suffix, however, is optional and, according to a middle-aged informant, of recent origin. It also appears optionally with verbs of the Imperative Order, as illustrated in the introduction to Notes on Morphology.

2.0 INDEPENDENT PRONOUNS

2.1 Demonstrative pronouns

My data contain no examples of any of the demonstrative pronouns in the 4th animate obviative or in the 5th obviative.

		Singular	Plural
this, these	3 an.	ʌwʌ	wuc (varying with) wuci
	3 in.	wu	wuhi
	4 in.	wuyɪw	wuyɪw
that, those	3 an.	ʌn	ʌnc (varying with) ʌnci
	3 in.	ʌn	ʌnɪhi
	4 in.	ʌnɪyɪw	ʌɴɪyɪw
that, those,	3 an.	ʌn	ʌnec (varying with) ʌneci
farther away	3 in.	ʌnc	ʌnehi
	4 in.	ʌneyɪw	ʌneyɪw

2.2 Personal pronouns

Personal pronouns, in the 1st, 2nd, and 3rd animate persons, are composed of morphemes, some of which are similar in form to the pronominal prefixes and suffixes with verbs in the Independent Order and to the possessive inflections of an. and in. nouns.

nIy	*I*
nIyan	*we, exclusive*
cIyanAw	*we, inclusive*
cIy	*you, singular*
cIyAwAw	*you, plural*
wIy	*he, she*
wIyAwAw	*they, an.*

3.0 INFLECTIONS FOR NUMBER AND OBVIATION

Animate and inanimate nouns in 3rd, 4th, and 5th obviative are inflected for singular and plural number by suffixation. The inflections of unpossessed nouns for the 5th obviative are nearly but not quite the same as those for the 4th obviative. Further work might show that the distinction for unpossessed nouns is spurious.[1]

Inflections

3.1 Animate nouns

	Singular	Plural
3rd	-(zero)	-Ac
4th	-A varying with -(zero)	-A varying with -(zero)
5th	-A varying with -(zero)	-A

/napew-/ *man:* /(nIcIwapAmaw) napew-(zero) /: *(I saw him) the man (3);* /(ciwapAmew) napew-A (or) napew-(zero)/: *he (3) saw him, them (4) the man, men (4);* /UKUSISA ciwapAmew) napew-A/: *his son (4) saw them (5) the men (5).*

3.2 Inanimate nouns

	Singular	Plural
3rd	-(zero)	-A
4th	-yIw varying with -(zero)	-A
5th	-yIw	?

/ut-/ *canoe:* /(nIciwapAhten) ut-(zero)/:*(I saw it) the canoe (3)*; /(wapAhtAm) ut-I-yIw (or) ut-(zero)/: *(he 3 saw it 4) the canoe (4)*; /UKUSISA ciwapAhtAm) ut-I-yIw/: *(his son 4 saw it 5) the canoe (5)*; /(ciwapAhtAm) ut-A/: *(he 3 saw them 4) the canoes (4).*

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[1] Inflections for 4th and 5th obviative show a distinction between a morpheme vs. alternative morphemes. This is true of unpossessed nouns of both genders. Possessed nouns, however, take different suffixes in 4th (-A varying with-(zero)) and 5th (-yIw). In addition, the pluralization patterns are different for 4th and 5th obviative.

4.0 THE POSSESSIVE INFLECTIONS

Nouns are inflected for possession by prefixes (nɪ- 1S and 1Pe; cɪ- 1Pi, 2S, and 2P; ᴜ- 3 and 4S and P) as well as by possessive suffixes. The prefixes add -t- before a stem beginning in a vowel. In a few nouns having an initial vowel, however, the prefixes appear as n-, k-, and w-: /n-apᴜy/ *my paddle*, from apᴜy/ *paddle*. Some nouns of both genders always appear with possessive inflections, and some of these may appear with the prefix mɪ- denoting an indefinite personal possessor: /nɪ-tun/ *my mouth;* /mɪ-tun/ *one's mouth.*

Nouns of each gender occur in two classes, Class I in each case adding -m to the stem before the addition of the possessive suffixes. Nouns of Class II add the suffixes directly to the stem. Other stem changes occur unpredictably. For example, /nɪhtᴀᴡᴜkaye/ *my ear*, with -(zero) suffix, drops -ye from the stem in the inflections for plural possessors; similarly, /n-apᴜy/ *my paddle* drops -y. The noun /ᴀtɪm/ *dog* has a stem /tem-/ in all the possessive inflections.

The 1st and 2nd person possessive prefixes and suffixes appear with nouns in the 3rd person obviative. With a few exceptions, these nouns are pluralized and made obviative by the same suffixes which apply to unpossessed nouns of the same gender.

The 3rd person possessive prefixes and suffixes appear with nouns in the 4th obviative. The obviative suffixes characteristic of unpossessed nouns do not appear, except for some animate nouns in the singular, which take -ᴀ. However, all noun subjects with a 3rd person possessor take obviative verbs. These nouns are pluralized by -ᴀ for a singular possessor, by -(zero) for a plural possessor.

The 4th person possessive prefixes and special obviative suffixes, different from those characteristic of 5th obviative unpossessed nouns, occur with nouns in the 5th obviative.

Plural suffixes of the noun follow the possessor suffixes.

4.1 3rd person obviative nouns with 1st and 2nd person possessors.

Inflectional affixes, nouns in 3S an. and in.

Possessor	1S	nɪ-	-(zero)
	1Pe	nɪ-	-nan, -an after stems in -n
	1Pi	cɪ-	-nᴀᴡ, -ᴀᴡ after stems in -n
	2S	cɪ-	-(zero)
	2P	cɪ-	-ᴀᴡᴀᴡ, -ᴡᴀᴡ after stems in -V

Animate, Class I: /ᴀᴡasɪs/ *child:* /nɪ-t-ᴀᴡasɪs-ɪ-m-ɪ-nan/ *our* (*excl.*) *child;* Class II: /ᴀscɪhkᴜ-/ *kettle:* /cɪ-t-ᴀscɪhkᴜ-ᴡᴀᴡ/ *your* (*P*) *kettle.* Inanimate, Class I: /mɪht-/ *stick of firewood:* /cɪ-mɪht-ɪ-m-(zero)/ *your* (*S*) *stick of firewood;* Class II: /wastenɪmakᴀn-/ *candle:* /cɪ-wastenɪmakᴀn-ᴀᴡ/ *our* (*incl.*) *candle.*

4.11 Pluralization of nouns with 1st and 2nd person possessors

3rd person obviative nouns with 1st and 2nd person possessors are pluralized by the animate and inanimate plural suffixes of unpossessed 3rd person obviative nouns, with a few exceptions. The exceptions occur in animate nouns with a 2nd person plural possessor and inanimate nouns with 1st person plural inclusive and 2nd person plural possessors. /ᴀwasɪs-/ *child* (an.): /ᴀwasɪs-ᴀᴄ/ *children:* /ᴄɪ-t-ᴀwasɪs-ɪ-m-ᴀᴡᴀᴡ-(zero)/ *your* (*P*) *child, children;* /wastenɪmakᴀn-/ *candle* (in.): /wastenɪmakᴀn-ᴀ/ *candles:* /ᴄɪ-wastenɪmakᴀn-ᴀᴡ-(zero)/ *our* (*incl.*) *candle, candles.*

Nouns possessed by other persons are pluralized like unpossessed nouns: /ᴀwasɪs/ *child* (an.): /nɪ-t-ᴀwasɪs-ɪ-m/ *my child*; /ᴀwasɪs-ᴀᴄ/ *children*: /nɪ-t-ᴀwasɪs-ɪ-m-ᴀᴄ/ *my children.* /wastenɪmakᴀn/ *candle* (in.): /nɪ wastenɪmakᴀn/ *my candle*; /wastenɪmakᴀn-ᴀ/ *candles*: /nɪ-wastenɪmakᴀn-ᴀ/ *my candles.*

4.12 Obviation of nouns with 1st and 2nd person possessors

My data cover only nouns with a 1st person singular possessor. The inflections are the same as for the obviation of unpossessed nouns in the 3rd person obviative. /minus-/ *cat* (an. Class I: /(ciwapᴀmew) nɪ-minus-ɪ-m-(zero) (or) nɪ-minus-ɪ-m-ᴀ/ (*he 3 saw it, them 4*) *my cat, cats* (*4*); /ut-/ *canoe* (in. Class II): /(ciwapᴀhtᴀm) nɪ-t-ut-ɪ-yɪw (or) nɪ-t-ut-(zero)/ (*he saw it 4*) *my canoe* (*4*); /(ciwapᴀhtᴀm) nɪ-t-ut-ᴀ/ (*he saw them 4*) *my canoes* (*4*). My data contain no examples of further obviation of these nouns, such as might appear in an utterance of the type "His (3) son (4) saw my cat (5)."

4.2 4th obviative nouns with 3rd person possessors

		Inflectional affixes, nouns in 4S an. and in.	
Possessor	3S	ᴜ-	-(zero), -ᴀ for some an. nouns
	3P	ᴜ-	-ᴀᴡᴀᴡ, -ᴡᴀᴡ after stems in -V

Animate, Class I: /ᴀwasɪs-/ *child:* /ᴜ-t-ᴀwasɪs-ɪ-m-(zero)/ *his child* (*4*); Class II: /ᴀscɪhkᴜ-/ *kettle:* /ᴜ-t-ᴀscɪhkᴜ-ᴡᴀᴡ/ *their kettle* (*4*); /-kᴜsɪs-/ *son:* /ᴜ-kᴜsɪs-ᴀ/ *his son* (*4*). Inanimate, Class I: /mɪht/- *stick of firewood:* /ᴜ-mɪht-ɪ-m-(zero)/ *his stick of firewood* (*4*); Class II: /wastenɪmakᴀn-/ *candle:* /ᴜ-wastenɪmakᴀn-ᴀᴡᴀᴡ/ *their candle* (*4*).

4.21 Pluralization of 4th obviative nouns with 3rd person possessors

4th obviative nouns with 3rd person singular possessors are pluralized by -ᴀ. With a 3rd person plural possessor, they are pluralized by -(zero). There is only partial similarity here to the pluralization of 4th obviative unpossessed nouns: 4P an. -ᴀ varying with -(zero); 4P in. -ᴀ. /ᴀwasɪs-(zero)/ or /ᴀwasɪs-ᴀ/ *children* (*4*) (an.); /ᴜt-ᴀwasɪs-ɪ-m-ᴀ/ *his children* (*4*); /ᴜ-t-ᴀwasɪs-ɪ-m-ᴀᴡᴀᴡ-(zero)/ *their children* (*4*). /wastenɪmakᴀn-ᴀ/ *candles* (*4*) (in.); /ᴜ-wastenɪmakᴀn-ᴀ/ *his candles* (*4*); /ᴜ-wastenɪmakᴀn-ᴀᴡᴀᴡ-(zero)/ *their candles* (*4*).

I have no examples of further obviation of these nouns. This theoretically possible inflection might appear in such an utterance as "John's (3) son (4) saw John's (3) cat (5)."

4.3 5th obviative nouns with 4th person possessors

		Inflectional affixes, nouns in 5S an. and in.	
Possessor	4S	ᴜ-	-yɪw (varying with) -(zero)
	4P	ᴜ-	-yɪw (varying with) -(zero)

Animate, Class I: /ᴀwasɪs-/ *child:* /ᴀwasɪs-ᴀ/ or /ᴀwasɪs-(zero) / *child (5):* /ᴜ-t-ᴀwasɪs-ɪ-m-ɪ-yɪw/ or /ᴜ-t-ᴀwasɪs-ɪ-m-(zero)/ *his, their (4) child (5);* Class II: /ᴀscɪhkᴜ-/ *kettle:* /ᴀscɪhkᴜ-yɪw/ or /ᴀscɪhkᴜ-(zero)/ *kettle (5):* /ᴜ-t-ᴀscɪhkᴜ-yɪw/ or /ᴜ-t-ᴀscɪhkᴜ-(zero)/ *his, their (4) kettle (5).* Inanimate. Class I: /mɪht-/ *stick of firewood:* /mɪht-ɪ-yɪw/ *stick of firewood (5):* /ᴜ-mɪht-ɪ-m-ɪ-yɪw/ or /ᴜ-mɪht-ɪ-m-(zero)/ *his, their (4) stick of firewood (5);* Class II: /wastenɪmakᴀn-/ *candle:* /wastenɪmakᴀn-ɪ-yɪw/ *candle (5):* /ᴜ-wastenɪmakᴀn-ɪ-yɪw/ or /ᴜ-wastenɪmakᴀn-(zero)/ *his, their (4) candle (5).*

4.31 Pluralization of 5th obviative nouns with 4th person possessors

Animate nouns with 4th person possessors are pluralized by -(zero): /ᴀwasɪs-ᴀ/ or /ᴀwasɪs-(zero)/ *child (5):* /ᴀwasɪs-ᴀ/ *children (5);* /ᴜ-t-ᴀwasɪs-ɪ-m-ɪ-yɪw/ or /ᴜ-t-ᴀwasɪs-ɪ-m-(zero)/ *his, their (4) child (5):* /ᴜ-t-ᴀwasɪs-ɪ-m-(zero)/ *his (4) children (5).* My data lack examples of plural animate nouns with 4th person plural possessor.

Inanimate nouns with 4th person possessors are pluralized by the suffix -ᴀ, and the possessor suffix -yɪw disappears: /wastenɪmakᴀn-ɪ-yɪw/ *candle 5*: (no example of in. 5th obviative plural); /ᴜ-wastenɪmakᴀn-ɪ-yɪw/ or /ᴜ-wastenɪmakᴀn-(zero)/ *his, their (4) candle (5):* /ᴜ-wastenɪmakᴀn-ᴀ/ *his, their (4) candles (5).*

5.0 THE LOCATIVE INFLECTION

My data for the locative inflection are limited to nouns in the singular 3rd person obviative.

The locative suffix -hc is added to animate and inanimate nouns. An unpossessed noun in -w drops -w before the suffix: /inɪskᴜtew/ *open fire* (an.): /inɪskᴜte-hc/ *on an open fire*; /nɪpi/ *water* (in.): /nɪpi-hc/ *on the water, in the water.* A possessed noun drops the final consonant of the possessor suffix: /nɪ-t-ᴀscɪhkᴜ-nan/ *our* (*excl.*) *kettle* (an.): /nɪ-t-ᴀscɪhkᴜ-na-hc/ *in our* (*excl.*) *kettle*; /nɪ-sakᴀhikᴀn-(zero)/ *my lake* (in.): /nɪ-sakᴀhikᴀn-ɪ-hc/ *at my lake.*

BIBLIOGRAPHY OF CANADIAN ANTHROPOLOGY FOR 1958

By T. F. McIlwraith[1]

Bandi, Hans-Georg. Einige Gegenstände aus Alaska und Britisch Kolumbien, gesammelt von Johann Wäber (John Weber), Bern/London während der Dritten Forschungsreise von James Cook 1776-1780 (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 214–20). Johann Wäber, commonly known as John Weber, was a member of Captain Cook's third expedition and brought back specimens from Alaska and northern British Columbia, which are preserved in the museum in Bern. A number of these are illustrated, together with Weber's original catalogue.

Bank, T. P. The Aleuts (*Scientific American*, CIC(5), Nov., 1958, 112–20). A well-balanced description of the history and culture of the Aleuts, the most deviant Eskimo whose aboriginal way of life has virtually disappeared and whose numbers are still diminishing.

Barbeau, Marius. *Haida Carvers in Argillite.* (National Museum of Canada, Bulletin 139, Anthropological Series No. 38.) Ottawa: Department of Northern Affairs and National Resources. 1957. Pp. viii, 214. This volume is a good example of Barbeau's interest both in culture and in individuals. After a brief description of the Haida as seen by the first explorers and of the early history of argillite carving, he deals with the work of each artist-craftsman, listing his productions and showing both the range of his interests and the idiosyncrasies of his style. The study is a contribution to ethnology, to art history, and to the accomplishments of individual native sculptors.

——— *Medicine Men on the North Pacific Coast.* (National Museum of Canada, Bulletin 152, Anthropological Series No. 42.) Ottawa: Department of Northern Affairs and National Resources. 1958. 95 pages. The broad subject of shamanism can be studied from many aspects, and Barbeau's versatility is shown clearly in the breadth of his approach. The major portion of the book comprises illustrations of sculptured depictions of shamans and curing ceremonies, executed either in argillite or wood and interspersed with descriptions of shamanistic rituals drawn largely from the author's own experiences. Included are chapters on shamanism in Alaska and Siberia, reprinted from older sources. This volume is, in fact, a combined study in the fields of art, ethnology, and ethno-history.

——— Migrations sibériennes en Amérique (International Congress of Americanists, 31st, 1954, *Miscellanea Paul Rivet Octogenario Dicata*, México, Universidad Nacional Autonoma de México, 1958, 17–48). Proof of the spread of peoples, as well as of cultural elements, from Asia to America is still to be found in similarities to both Siberian tribes and Indians of Alaska and northern British Columbia, in the fields of mythology, music, ethnology, ritual, and material culture.

Barnett, H. G. *Indian Shakers: A Messianic Cult of the Pacific Northwest.* Carbondale: Southern Illinois University Press. 1957. 378 pages. In this exhaustive study, Barnett emphasizes the importance of the leadership of John Slocum, who was instrumental in the growth of Shakerism as a curing cult in opposition to the established shamans. This is a significant contribution to the study of acculturation in the field of religious interaction; an example of a cult of European origin taking on new facets in a native setting.

Bergeron, Robert. Ungava Bay – Ungava Peninsula (*Canadian Geographical Journal*, LVII(1), July, 1958, 20–9). This popular article includes descriptions and photographs of modern Eskimo.

Bergsland, Knut. Aleut and Proto-Eskimo (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 624–31). A scholarly study of Eskimo and Aleut that not only gives evidence on the degree of relationship between these two languages of the same family but also opens up hypotheses on wider relationships with either Indo-European or Uralic stocks.

——— Is Lexico-Statistic Dating Valid? (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 654–7). Doubts are cast on the validity of dates established by glottochronology for the separation of Eskimo dialects in Greenland.

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Birket-Smith, Kaj. Boulder-Chip Scrapers in the Eastern Arctic (*Man*, LVIII, July, 1958, 113–4). Coarse scrapers of boulder chips are found commonly in western Eskimo sites and more rarely in the eastern Arctic; the author reports three specimens of this type from Greenland.

——— The Significance of Eskimology (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 46–50). In his presidential address to the International Congress of Americanists, the author points out the value of Eskimo studies in the fields of physical anthropology, linguistics, and ethnology, as well as in respect to international relations, since the Eskimo are among the few native inhabitants of both the Old and New Worlds.

Blasingham, Emily J. The "New England Indians" in the Western Great Lakes Region (*Proceedings of the Indiana Academy of Science*, LXVI, 1956, Indianapolis, 1957, 47–9). In search of furs and under pressure from white settlers, some of the Indians from New England had penetrated westward as early as 1616 to meet the Miami in what is now Indiana or Michigan. This western movement and settlement among the Miami continued until 1700.

Bleakney, Sherman. The Significance of Turtle Bones from Archæological Sites in Southern Ontario and Quebec (*The Canadian Field-Naturalist*, LXXII(1), Jan.–March, 1958, 1–5). Fragments of turtle bones from archæological excavations in southern Ontario and Quebec show that only three species were commonly used. The author suggests reasons for this, and for the non-utilization of other varieties; this article is an interesting example of cooperation between archæology and herpetology.

Bloomfield, Leonard. *Eastern Ojibwa*. Ann Arbor: University of Michigan Press. N.d. Pp. xi, 271. The data for this study, collected on Walpole Island, Ontario, in 1938, were prepared for publication prior to Bloomfield's death, and edited and seen through the press by Charles F. Hockett. This volume is probably definitive for the eastern Ojibwa, and most helpful for students of any of the Algonkian languages.

Boggs, Stephen T. Culture Change and the Personality of Ojibwa Children (*American Anthropologist*, LX(1), pt. 1, Feb. 1958, 47–58). If, as has been stated repeatedly, the basic personality pattern of the Ojibwa has remained virtually unaltered in spite of great cultural change, the author asks *how* this continuity has been maintained. Field work among the Ojibwa in Manitoba and Wisconsin indicates that this has not been due to the role of the parents; several hypotheses are postulated, but the answer is not clear.

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Canada: Department of National Health and Welfare. Indian and Northern Health Services (*Annual Report for the Fiscal Year ended March 31, 1957*, Ottawa, Queen's Printer, 1958, 76–93). Through an agreement formalized in 1956, the health services for residents of the Northwest Territories and the Yukon have been combined with those for the Indians of Canada as the *Indian and Northern Health Services*. This report describes the program of this body, with details of vital statistics, morbidity, staff, hospitals, and nursing stations.

Canada: Department of Northern Affairs and National Resources. National Museum of Canada—Human History Branch (*Annual Report, Fiscal Year 1957–1958*, Ottawa, Queen's Printer, 60–64). Northern Administration and Lands Branch (*Annual Report, Fiscal Year 1957–1958*, Ottawa, Queen's Printer, 23–36). These two reports summarize the activities of the respective units in regard to anthropological research work of the National Museum, and to administrative developments in the Arctic.

Carpenter, Edmund S. Journey into the Past (*Pennsylvania Archaeologist*, XXVIII(2), Aug., 1958, 72–6). In this brief article, the author paints a vivid picture of travel with a small group of Eskimo near the northern part of Baffinland. Incidents of hunting, of hardships and dangers, and of native philosophy are forcefully expressed in this essay of great literary merit.

——— Serpent on the Hill: The Story of a Sacred Grove (*Canadian Geographical Journal*, LVI(1), Jan., 1958, 2–15). In an interesting and informative style, the author describes the mound at Rice Lake, near Peterborough, Ontario; it is of the effigy type, probably connected with the Hopewell culture which centred in the Ohio Valley.

Carter, George F. Is there an American Lower Paleolithic? (International Congress of Americanists, 31st, 1954, *Miscellanea Paul Rivet Octogenario Dicata*, México, Universidad Nacional Autonoma de México, 1958, 227–43). In a convincing way the author summarizes the accumulating data on the antiquity of man in the New World and points out the typological resemblances of American artifacts to those of the early Palæolithic Age in Europe.

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——— Present Status of the Dorset Problem (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 557–60). Archæological investigations on Walrus Island are important in throwing light on early stages of the Dorset culture.

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Dailey, Robert C. The Midewiwin, Ontario's First Medical Society (*Ontario History*, L(3), summer, 1958, 133–38). Indicative of the paramount importance of health in any community is the fact that the only organized social group among the Ojibwa was the Midewiwin, whose function was the curing of sickness. In a scholarly compilation, based on analysis and comparison of early published sources, the author describes the structure of this graded society, and the methods of treatment, which were religious rather than medical in the modern sense of the term.

De Laguna, Frederica. Geological Confirmation of Native Traditions, Yakutat, Alaska (*American Antiquity*, XXIII(4), pt. 1, April, 1958, 434). Oral traditions of the Eyak Indians of southern Alaska concerning the advance and retreat of ice are in conformity with recent geological findings.

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——— Quetico Pictographs (*Ontario History*, L(1), winter, 1958, 44–5). A brief article reporting the locating and describing of pictographs on eleven sites in Quetico Provincial Park, Ontario.

——— The Quetico Pictographs (*The Beaver*, summer, 1958, 15–22). In a search for pictographs in Quetico Park, in western Ontario, the author discovered a number of Indian paintings on smooth rocks above water. The styles vary, but all seem to have been finger-painted; they appear to be prehistoric, but whether Ojibwa or Sioux is unknown.

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Drever, H. I. The Kayakers of Igdlorssuit (*Arctic*, XI (2), 1958, 123–7). An interesting description of life in summer in northern Greenland, reprinted from the *Alumnus Chronicle* of the University of St. Andrew's.

Drucker, Philip. *The Native Brotherhoods: Modern Intertribal Organizations on the Northwest Coast.* (Bureau of American Ethnology, Bulletin 168.) Washington: Smithsonian Institution. 1958. 194 pages. The goal of anthropological research in former generations was to record aboriginal customs in order to try to depict culture as it was before the spread of western civilization. The present volume is a pertinent example of the fact that native culture in modern times is equally worthy of study. The author describes the history and scope of *The Alaska Native Brotherhood* and *The Native Brotherhood of British Columbia*, two post-white organizations of Indians that developed as a result of economic and social stress. It is, therefore, a study in the growth of Indian economic adjustments in the process of cultural integration.

Duff, Wilson, and Michael Kew. Anthony Island, a Home of the Haidas (British Columbia, Department of Education, Provincial Museum of Natural History and Anthropology, *Report for the Year 1957*, Victoria, 1958, 37–64). The Haida Indians of Anthony Island, a small unit of the Queen Charlotte group, were among the northwest coast Indians who died out following European contact. This scholarly article, based on archæological and library study, summarizes the available knowledge of these people.

Dulong, Gaston. Rapport de l'Enquête linguistique faite à Cap-Pelé (Nouveau-Brunswick) (Canada, Department of Northern Affairs and National Resources, *Annual Report of the National Museum of Canada for the Fiscal Year 1955–56*, Bulletin 147, Ottawa, 1957, 65–6). A preliminary report on linguistic work in the French dialect spoken at Cap-Pelé, New Brunswick.

Dunning, R. Wm. Iroquois Feast of the Dead: New Style (*Anthropologica*, VI, 1958, 87–118). In 1956 the bones from an ossuary, which was accidentally disturbed during building operations in the outskirts of Toronto, were reinterred in ritual fashion as a Feast of the Dead, under the leadership of the Long House group from the Six Nations Reserve near Brantford. The author describes the procedure, supplementing this with comments and explanations by the participants.

——— Some Implications of Economic Change in Northern Ojibwa Social Structure (*The Canadian Journal of Economics and Political Science*, XXIV(4), Nov., 1958, 562–66). In this clear and well-documented study, the author shows how the increase of wealth and population among the Ojibwa of Pekangekum has resulted in three significant types of social change; namely, an intensification of kin *versus* non-kin behaviour, of band endogamy, and an apparent modification in incest attitudes. This is an important analysis of the permeative force of change in an isolated community.

Edmonson, Munro S. *Status Terminology and the Social Structure of North American Indians.* (The American Ethnological Society.) Seattle: University of Washington Press. 1958. Pp. vii, 84. As a means of studying social structure, the author has selected nine Indian cultures and, in each, analysed status under the headings of *Ascribed*, *Achieved*, and *Associational*, with a section on Cultural Complexity. In each case he considers pertinent relationships and includes the native terminology of the relevant categories. The approach is analytical and philosophical, of importance in the realm of methodology as well as of comparative social anthropology. Four of the cultures selected are Canadian.

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Emerson, J. Norman. Before the Flood (*Ontario History*, L (1), winter, 1958, 47–50). Working under pressure before the impending flooding of the area for the St. Lawrence Seaway, extensive collections of Point Peninsula material were recovered from Sheek Island, near Cornwall, Ontario. An unusual feature of the work was the use of a large mechanical scraper, of bulldozer type.

——— The Old Indian Fort Site (*Ontario History*, L (1), winter, 1958, 55–6). An extensive site in the northern part of York County, Ontario, was excavated by a large number of students from the University of Toronto. Although the age of the site cannot be definitely fixed, the pottery suggests affinities with Huron sites of the contact period; it is suggested that there may have been a northern movement of prehistoric Iroquois from the Humber valley, providing one of the elements of Huron culture.

Encyclopedia Canadiana (Vols. I–X). Ottawa: the Canadiana Company Ltd. 1957–8. In this encyclopædia of Canada, considerable attention is given to native peoples. As well as numerous shorter notes, articles on the following anthropological subjects are included: Abnaki Indians (I, 37–8), Algonkian (I, 129–31), Anthropology (I, 171–5), Archæology (I, 185–7), Assiniboine (I, 231–2), Athapaskan (I, 240–1), Bella Coola Indians (I, 362–3), Blackfoot (I, 403–4), Carrier Indians (II, 252–3), Chipewyan (II, 358), Coast Salish (II, 419–20), Cree (III, 144–5), Eskimo (IV, 35–42), Eskimo Handicrafts (IV, 42–5), Haida Indians (V, 56–7), Huron Indians (V, 208–9), Indian, Administration of the (V, 245–8), Indian, Canadian (V, 249–62), Indian Handicrafts (V, 262–8), Iroquois (V, 324–7), Kutchin (VI, 22–3), Kutenai (VI, 23), Kwakiutl (VI, 23–4), Neutrals (VII, 268), Ojibwa (VIII, 9–11), Potlatch (VIII, 279), Sekani Indians (IX, 269), Slave (or Slavey) Indians (IX, 326–7), Tlingit (X, 86–7), Totem Pole (X, 108–9), Tsimshian (X, 153–4).

Ewers, John C. Love Medicine (*The Beaver*, autumn, 1958, 40–1). A short article on love potions used by the Indians of the northern Plains.

Fenton, William N. *American Indian and White Relations to 1830*. Chapel Hill: University of North Carolina Press. 1957. Pp. x, 138. After pointing out that the study of Indian–white relations is a field common to both history and anthropology, Fenton contributes a scholarly essay on the sources available, as well as on the difficulties and points of view involved. The bibliography of source data, compiled by L. H. Butterfield, Wilcomb E. Washburn, and the author, is a valuable aid to research.

Freilich, Morris. Cultural Persistence Among the Modern Iroquois (*Anthropos*, LIII(3–4), 1958, 473–83). Many of the modern Mohawk are workers in high steel construction. The author believes that this is due, in part at least, to the fact that this occupation is in keeping with certain aboriginal culture traits, including group activity and strength in accomplishment.

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Garvin, Paul L. A Descriptive Technique for the Treatment of Meaning (*Language*, XXXIV(1), Jan.–March, 1958, 1–32). A highly technical linguistic paper on obviation in Kutenai, a language of southeastern British Columbia.

Gessain, Robert. Le Motif Vagina Dentata dans les Mythologies Eskimo et Nord Amerindiennes (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 583–6). The *vagina dentata* theme occurs widely in North and South America, as well as in Arctic Siberia. The author cites examples from the Eskimo and the Indians of British Columbia, discussing psychological implications as well as ethnological significance.

Gilliat, Rosemary. Transition (*The Beaver*, summer, 1958, 27–34). A pictorial record of Indians taking their part in the industrial activities of the modern Canadian world.

Gillies, D. A. *Canot du Maître* or Montreal Canoe (*Canadian Geographical Journal*, LVI(3), March, 1958, 114–19). A study of the canoes used in the fur trade developed into the manufacture of an example of this type, such as might have been used in 1810. Excellent photographs illustrate the steps in construction.

Gini, Corrado. *On the Extinction of the Norse Settlements in Greenland.* (Papers No. 10.) Bergen, Norway: The Institute of Economics, The Norwegian School of Economics and Business Administration. 1958. 27 pages. The author brings forward evidence that the disappearance of the Norse settlements in Greenland in the 13th and 14th centuries was due to a variety of causes, including an inbalance in the ratio of the sexes, hostility as well as amalgamation with the Eskimo, and destruction of the pastures by insect pests.

Gjessing, Gutorm. Petroglyphs and Pictographs in the Coast Salishan Area of Canada (International Congress of Americanists, 31st, 1954, *Miscellanea Paul Rivet Octogenario Dicata*, México, Universidad Nacional Autonoma de México, 1958, 257–275). In this scholarly summary of rock carvings and paintings in coastal British Columbia, the author describes and illustrates a variety of regional types, in some cases correlated with present-day tribes.

Haas, Mary R. A New Linguistic Relationship in North America: Algonkian and the Gulf Languages (*Southwestern Journal of Anthropology*, XIV(3), autumn, 1958, 231–264). Based largely on a comparison of reconstructed Proto-Central-Algonkian with reconstructed Proto-Muskogean, the author reaches the important conclusion that the Gulf languages are genetically related to Algonkian, with a separation period of perhaps 5,000 or 6,000 years.

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Haekel, Josef. Zur Frage Alter Kulturbeziehungen zwischen Alaska, Kalifornien und dem Pueblo-Gabiet (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 88–96). Attention is drawn to a number of cultural resemblances between Alaska, California, and the Southwest, including houses used only by men for ritual purposes.

Hammerich, L. L. The Origin of the Eskimo (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 640–4). In this plea for the utilization of linguistic data in hypotheses of Eskimo origins, the author points out the relative uniformity of the eastern Eskimo dialects, in contrast to the lack of uniformity among the Eskimo dialects of the western Arctic. Even on this basis alone the priority of western Eskimo culture might be postulated.

——— The Western Eskimo Dialects (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 632–9). The author maps the areas of dialectical differences among the Western Eskimo, noting the idiosyncrasies of the western language patterns.

Hanson, Harold C., and Campbell Currie. The Kill of Wild Geese by the Natives of the Hudson–James Bay Region (*Arctic*, X(4), 1957, 211–29). Geese are an important factor, though not a dominating one in the diet of the Indians and Eskimos of James Bay and Hudson Bay. The killing of geese by the natives appears to be a negligible factor in the population of these birds.

Harp, Elmer Jr. Prehistory in the Dismal Lake Area, N.W.T., Canada (*Arctic*, XI(4), 1958, 219–49). The results are given of detailed archæological work in the area of Coronation Gulf, primarily with the objective of clarifying the development of the Dorset culture. Artifacts from a number of sites are described and illustrated and their relationships to other cultures analysed; this is a scholarly contribution to Eskimo prehistory.

Harrington, Lyn. Chinook Jargon (*The Beaver*, winter, 1958, 26–9). A popular description of the Chinook "jargon," the *lingua franca* composed of simplified words from two Indian languages and reinforced with French and English terms. Probably of pre-contact origin, it developed rapidly in the early nineteenth century and served as a trade language for a hundred years.

Harrington, M. R. Some Iroquois Wampum (*The Masterkey*, XXXII(1), Jan.–Feb., 1958, 31–2). A brief description of two strings of wampum, with the significance of each; one of them came from the Six Nations Reserve, Ontario.

Hawthorn, H. B., C. S. Belshaw, and S. M. Jamieson. *The Indians of British Columbia*. Toronto: University of Toronto Press. 1958. Pp. xi, 499. This is a masterly description of the Indians of British Columbia today, as studied in terms of anthropology, sociology, and economics. With a brief background of native culture and demography, the authors discuss some of the problems dependent on aboriginal attitudes, including land and economics. Then follow informative chapters on present-day occupations, housing, family life, schools, crime, and social welfare, with a thought-provoking commentary on administration. This is an important book, both for the facts presented and for the application of social science research to modern Indian problems in British Columbia.

Heine-Geldern, Robert. Kulturpflanzengeographie und das Problem vorkolumbischer Kulturbeziehungen zwischen Alter and Neuer Welt (*Anthropos*, LIII(3–4), 1958, 361–402). The distribution of similar or identical species of cultivated plants on both sides of the Pacific has been used as a strong argument for pre-Columbian trans-oceanic culture contacts. The author discusses in great detail the weight of this evidence, but he believes that decisive conclusions must come from archæology, history, or ethnology.

Holtved, Erik. Remarks on Eskimo Semantics (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 617–23). In penetrating comments on the Eskimo language, the author notes how frequently concepts are expressed in terms of experience, particularly visual experience, and how they are also affected by attitudes toward time.

Honigmann, John J. Attawapiskat—Blend of Traditions (*Anthropologica*, VI, 1958, 57–67). In the history of acculturation among the Cree of Attawapiskat, both detrimental and desirable changes have taken place, but the result has been the emergence of a culture which appears to be meaningful and satisfying.

Hughes, Charles Campbell. Anomie, the Ammassalik, and the Standardization of Error (*Southwestern Journal of Anthropology*, XIV(4), winter, 1958, 352-77). A chapter on the Eskimo of Greenland in *Cooperation and Competition in Primitive Societies*, published in 1937 and used more recently as a basis for other synoptic tribal summaries, describes them as individualistic rather than cooperative. Hughes points out that the group described are the Ammassalik, a distinct group of Greenland Eskimo; furthermore, he takes issue with the original description, and comments on the danger of an error being perpetuated.

——— An Eskimo Deviant from the "Eskimo" Type of Social Organization (*American Anthropologist*, LX(6), pt. 1, Dec., 1958, 1140–47). In kinship terminology and in social structure, the Eskimo of St. Lawrence Island differ significantly from the Eskimo of the Eastern and Central Arctic, from whom is derived the generally accepted "Eskimo type." The author suggests a mechanism whereby the more highly organized western patterns may have developed from the eastern bands.

Hultkrantz, Åke. *The North American Indian Orpheus Tradition: A Contribution to Comparative Religion*. (The Ethnographical Museum of Sweden, Stockholm Monograph Series, Publication No. 2.) Stockholm, Sweden: Statens Etnografiska Museum. 1957. 340 pages. This study of myths describing attempts to rescue the dead from the nether-world is a continuation of the author's studies of North American Indian religious concepts. With intensive scholarship, he analyses myths having elements of this theme, tracing its distribution and the religious beliefs associated with it.

Hymes, D. H., and Harold E. Driver. Concerning the Proto-Athapaskan Kinship System (*American Anthropologist*, LX(1), pt. 1, Feb., 1958, 152–5). A critical comment on a point made by Charles B. White in a reconstruction of the Proto-Athapaskan kinship system.

The Indian News. (III(1), June, 1958; III(2) Oct., 1958.) Ottawa: Department of Citizenship and Immigration, Indian Affairs Branch. This attractively written little news-sheet, issued by the Government for distribution to Indians, is of permanent value for its records of current events pertaining to Indians, and of contemporary government attitudes. In conjunction with *The Native Voice*, q.v., it provides a summary of news items illustrating Indian activities in Canada in 1958.

Irving, Lawrence. Naming of Birds as Part of the Intellectual Culture of Indians at Old Crow, Yukon Territory (*Arctic*, XI(2), 1958, 117–22). Like the Eskimo of Alaska, many of their Kutchin neighbours in the Yukon identify most of the local species of birds, and the designatory terms are used with considerable accuracy. A list of the Kutchin names is given.

——— On the Naming of birds by Eskimos (*Anthropological Papers of the University of Alaska*, VI(2), May, 1958, 61–77). Dependent as they are upon local fauna and, to a lesser extent, flora, it is not surprising that the Eskimo have precise knowledge of mammals that are important to them, but their recognition of birds, which are of no practical utility, is somewhat unexpected. Natural history appears to be a topic of interest to the Eskimo of Alaska, and in two areas it was found that over 90 per cent of the local birds were known, and most of them were named.

Irving, William N. An Archaeological Survey of the Susitna Valley (*Anthropological Papers of the University of Alaska*, VI(1), Dec., 1957, 37–52). Archæological investigations in the Susitna valley, near Cook Inlet, Alaska, disclosed eleven sites, representing several cultures.

Jacobs, Melville. The Romantic Role of Older Women in a Culture of the Pacific Northwest Coast (*Kroeber Anthropological Society Papers*, XVIII, spring, 1958, 79–85). On the basis of information collected from the Tillamook of Oregon, the author suggests that the practice of sexual relations between elderly women and comparatively young men may have been widespread on the Northwest Coast.

Jannasch, Hans-Windekilde. Reunion with Mikak (*Canadian Geographical Journal*, LVII(3), Sept., 1958, 84–5). The childhood recollections of the author, who was born in Labrador, led to the identification of the portrait of an Eskimo woman as that of Mikak, a woman captured in Labrador in 1768 and taken to England.

Johnston, Richard B. The Findings After Two Years of Work at Serpent Mounds Site, Rice Lake, Ontario (*Proceedings of the Indiana Academy of Science*, LXVII, 1957, Indianapolis, 1958, 96–7). The mound on Rice Lake, near Peterborough, Ontario, appears to be of effigy type, unique in Canada, and perhaps was associated with the Hopewell culture of the Ohio valley. A number of burials have been excavated, but little grave goods found.

——— Serpent Mounds Excavation of 1957 (*Ontario History*, L (1), winter, 1958, 54–5). Excavation at the Serpent Mound, Rice Lake, Ontario, was concentrated on the eastern end of the main structure and a small adjoining mound. A number of burials were found, but there was a lack of grave goods. Preliminary work was carried out on shell-heaps on the lake shore.

Jones, H. M. Indian Affairs Branch (*Report of the Department of Citizenship and Immigration, 1957–58*, Ottawa, Queen's Printer, 1958, 47–96). This government report gives more than a mere statistical summary of the Indian population in regard to age groups, land holdings, school attendance, and economics, and, on the other hand, of government expenditures. The author, who is Director of the Indian Affairs Branch, succeeds in giving an overall current picture of trends and changes in the life of the Indians in each of the provinces.

Jury, Wilfrid. Huron Area Archaeology (*Ontario History*, L (1), winter, 1958, 57). In this summary of archæological progress in 1957, the author describes the work continuing on the Forget site in Simcoe County, including the recovery of a cache of copper artifacts. Reconstruction work was carried out on the military establishment at Penetanguishene.

Kehoe, Thomas F. Tipi Rings: The "Direct Ethnological" Approach Applied to an Archaeological Problem (*American Anthropologist*, LX (5), Oct., 1958, 861–73). Archæological and library research confirms the fact that the circles of stones found widely in Alberta and Montana were, as their popular name indicates, *tipi rings*. It is probable that stones were used commonly in early times to weight the bottoms of the skins of tipis, but they were largely replaced by pegs after the introduction of metal tools, which facilitated sharpening.

Kennedy, Clyde. Ottawa Valley Archaeology (*Ontario History*, L (1), winter, 1958, 50–2). Archæological investigations in the Ottawa valley have revealed a number of Point Peninsula sites as well as several of different periods having peculiar features. In one of these, obsidian flakes were found; in another, pottery coloured by powdered hematite; whereas one was on an old river beach, indicative of great antiquity.

Kenyon, Walter A. An Ancient Settlement in Bruce County (*Ontario History*, L (1), winter, 1958, 45–7). Archæological investigations of an extensive Indian site in Bruce County, Ontario, revealed four occupations stretching over a period of 5,000 years. The earliest was by a hunting people of unknown relationship, followed by Point Peninsula, Owasco, and Iroquoian cultures.

——— Archaeology of the English River District (*Ontario History*, L(1), winter, 1958, 52–4). An archæological survey of the English River district in northwestern Ontario revealed four village sites and a number of camp-sites, all on sandy beaches. The choice of these was probably due to the necessity of soft shores to land birch-bark canoes. One of the sites of the early contact period was excavated; the pottery resembles that made by the Assiniboine rather than the Ojibwa, the present inhabitants of the area.

Knuth, Eigil. Archaeology of the Farthest North (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 561–73). Eskimo sites in the extreme north of Greenland indicate at least two cultures; the older was of a trout-fishing and musk-ox hunting people. The relation of these prehistoric settlements to the Dorset Culture is obscure.

Kroeber, A. L. Sign Language Inquiry (*International Journal of American Linguistics*, XXIV(1), Jan., 1958, 1–19). Sign language among the Plains Indians, generally neglected since intensive study in the nineteenth century, is still used and may even have a wider distribution than formerly. It is a substitute for speech, and a modern innovation is that it is frequently accompanied by the spoken word.

Landy, David. Tuscarora Tribalism and National Identity (*Ethnohistory*, V(3), summer, 1958, 250–84). The Tuscarora were admitted as a Sixth Nation to the League of the Iroquois in the eighteenth century, but they still seem to feel a certain sense of inferiority or of junior brother status. They are as highly acculturated as any other Iroquois group but have a strong sense of Tuscarora pride and retain many elements of native culture, including a functioning political body in the Chiefs' Council.

Large, R. Geddes. *The Skeena, River of Destiny*. Vancouver: Mitchell Press. 180 pages. A history of the Skeena, containing much incidental information about the Indians of the area.

Larsen, Helge. The Material Culture of the Nunamiut and its Relation to other Forms of Eskimo Culture in Northern Alaska (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 574–82). Though few in numbers, the Nunamiut of the interior of northern Alaska show many cultural differences. A combination of coastal and inland traits characteristic of one group may, perhaps, be an ancient Eskimo pattern.

Laubin, Reginald and Gladys. *The Indian Tipi. Its History, Construction and Use.* Norman: University of Oklahoma Press. 1957. Pp. xvii, 208. This is the first comprehensive study of the Plains Indian tipi, its history, construction, and use, with chapters on associated traits such as the sweat lodge, cooking, and transportation. Written by two individuals who have used tipis, this book has the virtues of a scientific treatise, retaining at the same time the charm of the authors' enthusiasm. Stanley Vestal provides a scholarly introduction on the history of the tipi from published sources.

Laughlin, W. S. Blood Groups of the Anaktuvuk Eskimos, Alaska (*Anthropological Papers of the University of Alaska*, VI(1), Dec., 1957, 5–15). Blood grouping among the Eskimo of interior Alaska reveals a high percentage of type B, indicating extensive contact with other western Eskimo groups rather than with neighbouring Indian tribes.

——— Blood Groups of the Anaqtuavik Eskimos, Alaska (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 594). An abstract of the results of blood grouping among interior Alaskan Eskimo.

——— Neo-Aleut and Paleo-Aleut Prehistory (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 516–30). Excavations on Umnak Island, in the Aleutians, indicate that considerable cultural change has taken place; this is shown both in artifacts and in skeletal material. A significant physical modification was due to the incursion of the Neo-Aleut strain.

Lazarus, Arthur. Native Land Claims in Alaska (*The American Indian*, VIII(1), spring, 1958, 39–43). A legal statement on land rights and problems of the Indians of Alaska, which brings out many problems similar to those of northern Canada.

Leacock, Eleanor. Status among the Montagnais-Naskapi of Labrador (*Ethnohistory*, V(3), summer, 1958, 200–9). Among the Montagnais-Naskapi, having a marginal hunting economy, there is neither class nor formally ascribed status; status, which depends upon achievement, is limited to proved performance.

Lee, Thomas, E. Northern Survey (*Ontario History*, L(1), winter, 1958, 43–4). A preliminary description of an extensive survey of historic and prehistoric sites in the vicinity of Lake Nipigon and the western end of Lake Superior.

——— The Parker Earthwork, Corunna, Ontaria (*Pennsylvania Archaeologist*, XXVIII (1), April, 1958, 5–32). An extensive Indian site in Lambton County, Ontario, excavated and reported in the best scientific manner, is shown to have affinities with prehistoric cultures of Ohio and Michigan, perhaps Proto-Erie. Artifacts show contact, also, with early Neutral or other Iroquoian peoples. Two unusual features of the site are a large earthwork, perhaps for defence, and an abundance of corn hills.

Leechman, Douglas. The Native Tribes of Canada (*Canadian Banker*, LXIV(3), winter, 1958, 131–48). A well-balanced description of Canadian Indian culture, written for the intelligent lay reader.

Levin, M. G. Anthropological Types of the North-Eastern Paleo-Asiatics and Problems of their Ethnogenesis (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 607–16). A summary of the results of recent Russian investigations on the physical types, modern and prehistoric, of northeastern Siberia, with pertinent observations on possible cultural correlations.

Loewenstein, Prince John. The 'Eskimo Ulu' in the Malayan Neolithic (*Man*, LVIII, March, 1958, 37–41). Semi-lunar stone blades, similar in form to the Eskimo *ulu*, have been found in Neolithic sites in the Malay Peninsula; they may be derived from a common Mongoloid source in Arctic Siberia.

Lomax, Alan, ed. *The Columbia World Library of Folk and Primitive Music*, Vols. I–XIV. Bridgeport, Connecticut: Columbia Records, Inc. N.d. c.1955–56. 12″LP SL & KL 204–17. With modern equipment, it is possible not only to make accurate records of all types of music but to give them wide distribution. Volume VIII of this series includes Iroquois, Caribou Eskimo, and West Coast Indian songs as well as French-Canadian and English ballads.

Lot-Falck, Eveline. Les Masques Eskimo et Aléoutes de la Collection Pinart (*Journal de la Société des Américanistes*, XLVI, 1957, 5–43). This is an important article, both for its classification of Eskimo masks from Alaska and the Aleutian Islands, with descriptions of their art styles and materials used, and for the illustrations. These make available examples of a significant and little-known aspect of Eskimo culture.

Lowie, Robert H. The Culture Area Concept as Applied to North and South America (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 73-8). An analysis of culture areas shows that the concept must be regarded as ecological, since social and religious traits within a given area are frequently dissimilar.

Lucier, Charles. Noatagmiut Eskimo Myths (*Anthropological Papers of the University of Alaska*, VI(2), May, 1958, 89–117). This collection of legends was made on Kotzebue Sound, Alaska. The texts, translated into English by a bilingual Eskimo, are given almost verbatim.

——— Wolf Kill Observances, Northwest Alaska (*Anthropological Papers of the University of Alaska*, VII(1), Dec., 1958, 39). A brief note on rituals performed by the Eskimo of northwest Alaska following the killing of a wolf.

McIlwraith, T. F. The Feast of the Dead: Historical Background (*Anthropologica*, VI, 1958, 83–6). A brief note on the history of the Huron mortuary ceremony known as the Feast of the Dead, relevant to a revival of this ritual in the outskirts of Toronto in 1956.

——— The Puckasaw Pit Culture (*Ontario History*, L(1), winter, 1958, 41–43). This is a preliminary description of pits in boulder beaches along a stretch of one hundred miles on the north shore of Lake Superior. It has been impossible thus far to prove their age or cultural affiliations, although they appear to be of great antiquity.

McIvor, A. B. Rabbit Skin Robe (*The Beaver*, winter, 1958, 46–7). A series of excellent photographs illustrating the manufacture of a rabbit skin robe by the Indians of Fort Hope in northern Ontario.

MacLachlan, Bruce B. Communities of Societal Indians in Canada (*Anthropologica*, VI, 1958, 69–77). In studying the population of Canadian Indians, the author points out that differences exist between those who are legally Indians and those who are biologically or culturally Indians. Reasons for this discrepancy are noted, and figures are given of the demographic picture throughout the country.

MacNeish, Richard S. *An Introduction to the Archæology of Southeast Manitoba* (National Museum of Canada, Bulletin 157, Anthropological Series 44). Ottawa: Department of Northern Affairs and National Resources. 1958. Pp. v, 184. This volume is a description of extensive work in Manitoba, with hypotheses and problems, far more than is suggested by its modest title. Nine excavations are described, with details of the artifacts recovered, followed by an historical reconstruction of the foci represented. Manitoba archæology reveals a sequence of cultural horizons of more than four thousand years; the tracing of these opens up significant problems of contact with adjacent areas. This is an important contribution to North American archæology.

MacNeish, R. S., and K. H. Capes. The United Church Site near Rock Lake in Manitoba (*Anthropologica*, VI, 1958, 119–55). Archæological work at Rock Lake in southern Manitoba resulted in the recovery of material that shows considerable cultural change; several of the horizons can be correlated with material from other sites, thus laying the foundation for a chronology based on artifact types.

McNickle, D'Arcy. Indian and European: Indian-White Relations from Discovery to 1887 (*The Annals of the American Academy of Political and Social Science*, CCCXI, May, 1957, 1–11). Written in scholarly style for the intelligent non-specialist, this essay presents an informative picture of the history of Indian-White contacts in North America, with an exposition of the attitudes involved.

——— The Indians of the United States (*América Indígena*, XVIII(2), April, 1958, 99–118). Intended for readers in Mexico and South America, this article gives a lucid summary of the Indian population of the United States, arranged on a geographical and cultural basis. Regional and general bibliographies are included.

Madison, Grant. Across the River (*The Beaver*, autumn, 1958, 42–5). An illustrated description of Indian bridges in British Columbia, the only part of Canada where such structures were built.

Mallery, Arlington H. The Pre-Columbian Discovery of America: A Reply to W. S. Godfrey. (*American Anthropologist*, LX(1), pt. 1, Feb., 1958, 141–52). The author's belief that much of eastern America was explored by the Vikings is based on three main contentions: (*a*) That Viking maps show recognizable features of America: (*b*) That Viking house remains and iron in Newfoundland, and furnaces in Ohio have been found; (*c*) That the Newport Tower in Rhode Island is earlier than the Colonial period.

Mason, Ronald J. *Late Pleistocene Geochronology and the Paleo-Indian Penetration into the Lower Michigan Peninsula.* (Anthropological Papers, Museum of Anthropology, University of Michigan, No. 11.) Ann Arbor: University of Michigan. 1958. 48 pages. The occurrence of fluted points resembling Clovis types, in Michigan and Ontario, suggests an incursion of a Paleo-Indian hunting culture into the Great Lakes area following the retreat of the Cary phase of the Wisconsin glaciation.

Mechling, W. H. The Malecite Indians, with notes on the Micmacs (*Anthropologica*, VII, 1–160 + xvi). The field work for this study of the Malecite of New Brunswick was carried out by the National Museum (then the Victoria Memorial Museum) between 1910 and 1913; the manuscript was submitted in 1916 and has therefore remained in the files of the museum for more than forty years. This article comprises the first five chapters of Mechling's report. The work, which is a combination of ethnological field investigations and library research, gives an overall picture of Malecite life. Since their culture has virtually disappeared, this report is a definitive compilation of information on a little-known eastern Algonkian tribe.

Meldgaard, Jørgen. Dorset Kulturen. Den Dansk-amerikanske ekspedition til Arktisk Canada 1954 (*Kuml*, [Denmark], 1955, 158–77). In 1954 a joint expedition of the Danish National Museum and the Pennsylvania University Museum carried out extensive archæological work on Dorset sites near Igloolik and on Baffin Land. A sequence of Dorset culture was revealed, stemming from a horizon with slate blades, gradually developing into the typical Dorset forms. Data on house sites and on graves were obtained by excavation, and traditions of the Dorset people were gleaned from the myths of the modern Eskimo.

Michael, Henry N. The Neolithic Age in Eastern Siberia (*Transactions of the American Philosophical Society*, XLVIII, pt. 2, 1958, 3–108). This exhaustive study of the Neolithic Age in eastern Siberia is of importance to Canadian anthropologists for the light thrown on cultural developments in the Arctic and on possible origins of Eskimo traits.

Moorrees, Coenraad F. A. *The Aleut Dentition: A Correlative Study of Dental Characteristics in an Eskimoid People.* Cambridge, Massachusetts: Harvard University Press. 1957. 196 pages. This comprehensive study of the dentition of the Aleuts describes a number of important aspects of dental typology, wear, and growth, as well as confirming two generally recognized facts, namely, the Mongoloid affinities of the Aleuts and the biological differences between the eastern and western islanders.

Mowat, Farley. *Coppermine Journey: An Account of a Great Adventure—Selected from the Journals of Samuel Hearne.* Toronto: McClelland & Stewart Ltd. 1958. Pp. xiv, 144. A popular rendering of Hearne's account of his memorable journey across the Barren Lands, written with the purpose of making available to the general reader one of the outstanding exploits in Canadian exploration.

National Commission on the Indian Canadian, Bulletin. (I–IV, 1957–58, quarterly.) Toronto: 113 St. George St. The National Commission on the Indian Canadian is a non-professional group formed under the leadership of the Canadian Association for Adult Education. Its bulletins, describing conferences and reporting new items, are indicative of the increasing consciousness of Canadians, in general, to the existing Indian problems. It was to stimulate this interest that the group was organized.

The Native Voice. (XII (1–12), Jan.–Dec., 1958, monthly.) Vancouver: Native Voice Publishing Co., 325 Standard Building. Although *The Native Voice* does not fit into any of the accepted patterns of anthropological source material, its comments and items of news about Indians provide important documentary records of their changing attitudes and interest, all the more valuable because written by Indians.

Okladnikov, A. P. Ancient Cultures and Cultural and Ethnic Relations on the Pacific Coast of North Asia (International Congress of Americanists, 32nd, 1956, *Proceedings,* Copenhagen, 1958, 545–56). This useful summary of the results of Soviet archæological work in northeastern Siberia throws light on comparable cultural changes among the North American Eskimo.

Olson, James C. Some Reflections on Historical Method and Indian History (*Ethnohistory,* V(1), winter, 1958, 48–59). A thoughtful commentary from an historian on the problems of history writing as it pertains to the Indians, in view of the necessity of relying upon material from non-Indian and often biased sources.

Ortega y Medina, Juan A. Ideas de la Evangelización Anglosajona entre los Indígenas de los Estados Unidos de Norteamérica (*América Indígena,* XVIII(2), April, 1958, 129–44). In the broad perspective of sixteenth century religious philosophy, especially as shown in evangelism, the author studies missionary attitudes and principles as applied in New England, with a final comparison of methods followed in New Spain and Canada.

Osborne, Douglas. Western American Prehistory—an Hypothesis (*American Antiquity,* XXIV(1), July, 1958, 47–52). Archæological work in various parts of the west coast from California to British Columbia has provided the data for far-reaching hypotheses of prehistoric movements. Osborne analyses this extensive material in a masterly fashion and stresses the importance of ecological factors in cultural change.

Osgood, Cornelius. *Ingalik Social Culture.* (Yale University Publications in Anthropology, LIII.) New Haven: Yale University Press. 1958. 289 pages. This is an extremely important contribution, not only to the ethnology of the northern Athapaskans, but to social anthropology as a whole. Based on field work carried out in 1936 and 1937, it gives a satisfactory picture of all aspects of social life, with particular emphasis on ritual. This is undoubtedly the definitive study of Ingalik society and personal relations and a model for other publications in this field.

Oswalt, W. H. A Western Eskimo Ethnobotany (*Anthropological Papers of the University of Alaska,* VI(1), Dec., 1957, 16–36). Among the Eskimo of the Kuskokwim River in Alaska, a considerable number of plants are known and used in varying extents. The author describes the native system of classification as well as the utilization by the Eskimo of plants for foods, fuel, manufacturing, medicine, perfumes, and ceremonial purposes.

Paddock, John. The War of the Myths (*América Indígena,* XVIII(4), Oct., 1958, 281–92). In this interesting comparison of English and Spanish policy toward the Indians in the early period of contact, the author dispels many of the over-simplified generalizations about attitudes and treatment, showing that these must be viewed in the light of history, with proper regard to ecology and demography.

Peterson, Len. Frobisher Bay—Halfway to Somewhere (*The Beaver*, winter, 1958, 48–53). A popular article, with photographs, of the new town of Frobisher Bay, illustrating the life of the modern Eskimo.

Quimby, George I. Silver Ornaments and the Indians (International Congress of Americanists, 31st, 1954, *Miscellanea Paul Rivet Octogenario Dicata*, México, Universidad Nacional Autonoma de México, 1958, 317–37). Silver crosses, gorgets, brooches, and other ornaments were traded or presented to the Indians in various parts of North America in the eighteenth and nineteenth centuries. The author describes the principal types and the history of their manufacture and distribution.

Rands, Robert L., and Carroll L. Riley. Diffusion and Discontinuous Distribution (*American Anthropologist*, LX(2), pt. 1, April, 1958, 274–97). To illustrate a technical and theoretical question of culture growth and of parallel and discontinuous distributions, the authors analyse a number of traits, including the treatment of prisoners by the Iroquois.

Reichard, Gladys A. A Comparison of Five Salish Languages: I (*International Journal of American Linguistics*, XXIV(4), Oct., 1958, 293–300). In this scholarly linguistic comparison of languages of Oregon and Washington is included work on some of the Coast Salish bands of southwestern British Columbia.

Renaud, André. Indian Education Today (*Anthropologica*, VI, 1958, 1–49). In this comprehensive study of present-day Indian education, the author considers the academic achievement of Indian children, curricula, boarding and day schools, and the objectives of Indian education. Studies such as this indicate a growing awareness to Indian problems.

Residential Education for Indian Acculturation. Ottawa: Indian and Eskimo Welfare Commission, Oblate Fathers in Canada. 1958. 81 pages. The Oblates of Mary Immaculate, in cooperation with several Orders of Sisters, operate forty-four residential schools for Indians and Eskimos in different parts of Canada. This report, which contains the papers presented at a week's conference of the principals of these schools, has for its basic theme the place of the residential school in the process of acculturation. The scholarship shown throughout is an indication of the depth of study now being given to the education of Indians in relation to their adjustment to modern conditions.

Richards, Cara E. Of Vikings and Longhouses: A Reply to A. H. Mallery (*American Anthropologist*, LX(6), pt. 1, Dec., 1958, 1199–1203). In support of his thesis of extensive Viking influence in the New World, Mallery, q.v., cites similarities found in Viking and Iroquois longhouses, implying the uniqueness of rectangular communal dwellings. The author attacks this thesis, showing that dwellings of this general type occur in many parts of the world, and that there were significant differences between the Viking and Iroquois buildings.

Ridley, Frank. The Boys and Barrie Sites (*The Ontario Archaeological Society*, Publication No. 4, January, 1958, 18–42). Pottery excavated on two sites in southern Ontario, east of Toronto, indicates a greater continuity for certain motifs than is generally recognized and that some of the elements have a wider distribution than commonly believed. This is an important paper in the significance of ceramic analysis. In an appendix, Thomas E. Lee, formerly of the National Museum of Canada, notes the resemblance of sherds from these sites to forms from the Glen Meyer focus in southwestern Ontario.

——— Did the Huron Really Migrate North from the Toronto Area? (*Pennsylvania Archaeologist*, XXVIII(3-4), Dec., 1958, 143–4+150). Basing his arguments on analysis of pottery types, the author attacks the hypothesis of MacNeish and Emerson that the Hurons moved northward to Huronia from the Toronto region.

——— Sites on Ghost River, Lake Abitibi (*Pennsylvania Archaeologist*, XXVIII(1), April, 1958, 39–56). An archæological survey of Lake Abitibi, in Northern Ontario, revealed a number of sites showing occupancy over a long period of time. As the author modestly states, much of the material was essentially surface finds, but of greater importance were the findings on an excavated site of Iroquoian pottery associated with artifacts of what would be regarded farther south as pre-Iroquoian types.

Rioux, Marcel. Rapport préliminaire de l'Étude sur la Culture acadienne du Nouveau-Brunswick (Canada, Department of Northern Affairs and National Resources, *Annual Report of the National Museum of Canada for the Fiscal Year 1955–56*, Bulletin 147, Ottawa, 1957, 62–4). A preliminary report on a minority group in New Brunswick, the Acadians, who appear to have developed and maintained a distinctive French culture, different from that of the Province of Quebec.

Ritchie, William A. The Paleo-Indian in the Northeast (*Bulletin of the Massachusetts Archaeological Society*, XIX(2), Jan., 1958, 21–2). Though traces of Paleo-Indian occupancy of the northeast are relatively scanty, a number of fluted points of the Clovis type have been found. Their distribution suggests that their makers, hunters of large mammals, moved northward, occupying the area for a relatively short period between 5000 and 3500 B.C.

Robinson, Gordon. *Tales of Kitamaat.* Kitimat, B.C. Northern Sentinel Press. 1956. 46 pages. A collection of local folk-tales, compiled by a Haisla Indian, which displays a blending of native and western elements.

Rousseau, Jacques. *Astam mitchoun!* Essai sur la Gastronomie amérindienne (Les Cahiers des Dix, XXII, 1957, 193–211). An interesting and informative essay on Indian foods and cooking among the Iroquois, the Algonkians, and the Eskimo of northern Quebec.

Roy, Carmen. Les Jeux en Gaspésie (Canada, Department of Northern Affairs and National Resources, *Annual Report of the National Museum of Canada for the Fiscal Year 1955-56*, Bulletin 147, Ottawa, 1957, 67–83). This comprehensive study of games is a contribution to an overall picture of the folk practices of the Gaspé region.

Service, Elman R. *A Profile of Primitive Culture.* New York: Harper & Brothers. 1958. Pp. xiv, 474. This is another example of a book planned primarily for university students, summarizing the culture of native groups of varying economic and cultural complexity. Among those included are the Central Eskimo of the Canadian Arctic and the Nootka of Vancouver Island.

Sherwood, Angus. Some Remarks about the Athapascan Indians (*Anthropologica*, VI, 1958, 51–6). On the basis of forty-seven years among the Beaver and neighbouring Athapaskan-speaking tribes, the author makes a number of observations on their attitudes to one another and to the white men, on their behaviour and morals, and on the changes that have so drastically transformed their lives.

Simon the Artist. Adrift (*The Beaver*, summer, 1958, 39–46). A series of drawings by an Eskimo, illustrating his adventures and those of his eight comrades when carried into Hudson Bay on drifting ice. Captions written in syllabics and translated into English give a vivid picture of the dangerous experience.

Skarland, Ivar, and Charles J. Keim. Archaeological Discoveries on the Denali Highway, Alaska (*Anthropological Papers of the University of Alaska*, VI(2), May, 1958, 79–88). Artifacts from two sites in the Alaska Range are illustrated and described briefly. Heavily glaciated until recently, the area appears to have been used by wandering caribou hunters.

Snyderman, George S. The Manuscript Collections of the Philadelphia Yearly Meeting of Friends pertaining to the American Indian (*Proceedings of the American Philosophical Society*, CII(6), Dec., 1958, 613–20). As part of a project sponsored by the American Philosophical Society, the author describes a collection of manuscripts of the Society of Friends in Philadelphia, which he has been examining with a view to microfilming. The material ranges from land sales in the early 18th century to Seneca school problems in the mid-nineteenth century.

Spencer, Robert F. Eskimo Polyandry and Social Organization (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 539–44). Although polyandry has been widely reported among the Eskimo, the practice is difficult to substantiate since there is often uncertainty whether marriage is involved, or whether it is a matter of accepted marital relations.

Sperry, John R. To the Inlanders (*The Beaver*, autumn, 1958, 22–5). An illustrated description of a visit to a group of Coppermine Eskimo who have recently moved inland to share the life of the Caribou Eskimo.

Spindler, George D. Research Design and Ojibwa Personality Persistence (*American Anthropologist*, LX(5), Oct., 1958, 934–37). The author disagrees with the conclusions of Boggs, q.v., on the persistence of personality traits among the Ojibwa and on the influence of child-training in this connection.

Spindler, George D., and Louise S. American Indian Personality Types and Their Sociocultural Roots (*The Annals of the American Academy of Political and Social Science*, CCCXI, May, 1957, 147–57). Indian personality patterns appear to vary among tribal groups and to have some correlation with culture areas. There is evidence to show that these patterns are relatively stable and are a factor in the emergence of attitudes of cultural adjustment.

Squire, Bowen P. The Indian Site at Consecon (*Historic Kingston*, VII, Nov., 1958, 53–63). A large site near Consecon, in Prince Edward County, Ontario, has disclosed late Iroquoian artifacts, as well as objects from earlier horizons. It is tempting to wonder whether this was where Champlain spent part of the winter 1615–16; also, it may have been the site of the Quinté mission. No European trade goods have been recovered to prove occupancy in the contact period.

——— The Squire Site, Consecon (*The Ontario Archaeological Society*, Publication No. 4, Jan., 1958, 4–17). Artifacts recovered over a period of years by a local archæologist near Consecon in Prince Edward County, Ontario, show that the site was occupied, perhaps at intervals, from Laurentian times until the late prehistoric period. No contact material has been recovered.

Stevens, Gerald. Toniata (*Historic Kingston*, VII, Nov., 1958, 15–27). An amateur archæologist describes in a bright and interesting manner the search for the location of Toniata, an Indian village near Gananoque, Ontario, mentioned repeatedly in historical documents of the seventeenth and eighteenth centuries.

Suttles, Wayne. Private Knowledge, Morality, and Social Classes among the Coast Salish (*American Anthropologist*, LX(3), June, 1958, 497–507). Among the Coast Salish there was a stratified system of society with a numerically large upper class and a small group of low-class individuals. It seems probable that individual behaviour was largely controlled by the precepts of acting in accordance with the rules of upper-class society.

Swadesh, Morris. Some New Glottochronologic Dates for Amerindian Linguistic Groups (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 671–4). In a progress report, the author presents a number of estimates of the periods required for the degree of differentiation now found in several North American language families on the basis of glottochronological interpretations.

Sweetman, Paul W. The Boyd Site (*The Ontario Archaeological Society*, Publication No. 4, Jan., 1958, 1–3). This is a brief summary of an Iroquois site of late Lalonde period, excavated near Woodbridge in southern Ontario.

——— Ontario Archaeological Society Activities (*Ontario History*, L(1), winter, 1958, 58–9). The Ontario Archæological Society has demonstrated what can be done by a group of trained and enthusiastic amateur archæologists. Their chief undertaking in 1957 was the excavation of a late prehistoric Iroquois site near Woodbridge in York County.

——— The Pennycook Site (*Pennsylvania Archaeologist*, XXVIII(2), Aug., 1958, 94–6). A brief description of a site of the contact period in Haliburton County, Ontario, which contained in addition to Iroquoian pottery of Lalonde type, conical copper ornaments used as pouch pendants.

Swinton, George. Eskimo Carving Today (*The Beaver*, spring, 1958, 40–7). In this brief, well-illustrated article, the author describes eastern Eskimo sculpture, which he feels to be a new art, and yet one in which the modern Eskimo expresses something of his aboriginal personality.

Taylor, William E., Jr. Archaeology in the Canadian Arctic (*Canadian Geographical Journal*, LVII(3), Sept., 1958, 92–5). In a brief but informative summary, the author describes some of the problems of tracing prehistoric Eskimo cultures and comments on the developments since 1925.

Tentori, Tullio. Rudimenti di Arte Drammática fra gli Indigeni Americani (International Congress of Americanists, 31st, 1954, *Miscellanea Paul Rivet Octogenario Dicata*, México, Universidad Nacional Autonoma de México, 1958, 189–96). The author describes the distribution of various types of dramatic rituals in America; one of the important areas is that of the coastal Indians of British Columbia.

This is the Arctic. Ottawa: Department of Northern Affairs and National Resources, Northern Administration and Lands Branch. 1958. 54 pages. Written in very popular style and illustrated with amusing cartoons, this booklet gives a large amount of accurate information about modern conditions, laws, and life in the Arctic, particularly in regard to the Eskimo.

Thompson, J. Eric S. The First Peopling of the New World (*American Antiquity*, XXIV (2), Oct., 1958, 184). Among the earliest proponents of the thesis that the New World was settled from Asia was Thomas Gage, who noted in 1648 the resemblances common to the Indians and the Tartars.

Thompson, June Cutt. Cree Indians in North-Eastern Saskatchewan (*Saskatchewan History*, XI(2), spring, 1958, 41–58). In this description of the Plains Cree, written for the general reader, the author introduces many facts of their aboriginal culture, particularly those elements which have left significant influences upon their present-day life.

Tolstoy, Paul. The Archaeology of the Lena Basin and Its New World Relationships. Pt. I (*American Antiquity*, XXIII(4), pt. 1, April, 1958, 397–418); Pt. II (*American Antiquity*, XXIV(1), July, 1958, 63–81). This comprehensive study of the archæological sequence in the Lena Basin, on the basis of recent Russian publications, gives a solid basis for consideration of cultural influences from Asia on American prehistory.

Uht, Charles. Art of Aboriginal America (*Natural History*, LXVII(6), June–July, 1958, 330–7). Photographs of examples of Indian art, shown at the World's Fair in Brussels, illustrate some superb specimens from the Northwest Coast and the Arctic.

Underhill, Ruth. Religion Among American Indians (*The Annals of the American Academy of Political and Social Science*, CCCXI, May, 1957, 127–36). A valuable summary of aboriginal religious beliefs, with special reference to those which have affected adjustment problems.

van den Steenhoven, Gert. Caribou Eskimo Legal Concepts (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 531–8). In this scholarly study of Caribou Eskimo legal concepts, the author discusses the terminology of *law* in contrast to *custom*, and illustrates the point with reference to the inland Eskimo, whose accepted customs are an effective method of controlling behaviour.

Van Steen, Marcus. Brantford's Royal Chapel (*Canadian Geographical Journal*, LVII(4), Oct., 1958, 136–41). The Mohawk Chapel, near Brantford, is a Royal Chapel, built in 1785, and contains communion vessels and a bible presented by Queen Anne in 1712 for the original building in the Mohawk Valley, New York State.

Van Stone, James W. An Eskimo Community and the Outside World (*Anthropological Papers of the University of Alaska*, VII(1), Dec., 1958, 27–38). Although relatively isolated from the rest of the world, the life of the modern Eskimo inhabitants of Point Hope is profoundly influenced by cultural factors from abroad. This is a concrete example of analysis of change in a small community.

——— (Ed.) The Autobiography of an Alaskan Eskimo (*Arctic*, X(4), 1957, 194–210). This autobiography of a thirty-year-old Eskimo from Point Hope, written, apparently, with few inhibitions, gives an interesting picture of the activities and desires of an Eskimo lad growing up in the thirties, with emphasis on hunting, love, and jobs.

Vebæk, C. L. Ten Years of Topographical and Archaeological Investigations in the Mediæval Norse Settlements in Greeland (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 732–43). This summary of the results of archæological investigations of the Norse settlements in Greenland should be noted by Canadian anthropologists as illustrating cultural change in an area of importance in the early history of the eastern Arctic.

Voegelin, C. F. Sign Language Analysis, on One Level or Two? (*International Journal of American Linguistics*, XXIV(1), Jan., 1958, 71–7). In connection with Kroeber's inquiry, q.v., into sign language among the Plains Indians, the author raises the question of whether an analysis of the subject might not reveal what would be virtually linguistic elements.

Vogt, Evon Z. The Acculturation of American Indians (*The Annals of the American Academy of Political and Social Science*, CCCXI, May, 1957, 137–46). Though dealing specifically with the Indians of the United States, the author's analysis of the degrees of acculturation in different culture areas, of factors governing the speed or retardation of integration, and of the development of pan-Indianism are equally relevant to Canada.

Wahlgren, Erik. *The Kensington Stone, a Mystery Solved*. Madison: University of Wisconsin Press. 1958. Pp. xiv, 228. This appears to be the final chapter in the Kensington Stone, long claimed as a record of a Scandinavian expedition that reached Minnesota in 1362. By detailed analysis of the runic inscription, supplemented by a considerable amount of detective work, the author concludes that the carvings on the stone were cut in the 1890's as a hoax, a hoax sufficiently clever to deceive scholars fifty years later.

Wallace, Anthony F. C. The Dekanawideh Myth analyzed as the Record of a Revitalization Movement (*Ethnohistory*, V(2), spring, 1958, 118–30). Analysis and comparison of a number of versions of the Dekanawideh myth of the Iroquois indicate that they are somewhat distorted records of a revitalization movement led by Hiawatha in the pre-contact period, several centuries before the tradition was written down.

——— Dreams and the Wishes of the Soul: A Type of Psychoanalytic Theory Among the Seventeenth Century Iroquois (*American Anthropologist*, LX(2), pt. 1, April, 1958, 234–48). The Jesuit missionaries in the seventeenth century recorded many Iroquois dreams and commented on their importance in the life of the community. Their evidence, in fact, supports the theory that dreams have been one of the main sources of cultural innovation. The interpretative system used by the Iroquois was basically psycho-analytical.

White, Charles B. Rejoinder [to D. H. Hymes and Harold E. Driver concerning the Proto-Athapaskan Kinship System] (*American Anthropologist*, LX(1), pt. 1, Feb., 1958, 155–6). A brief rejoinder to the criticism of Hymes and Driver, q.v., concerning the reconstruction of the proto-Athapaskan kinship system.

White, Marian E. An Iroquois Sequence in New York's Niagara Frontier (*Pennsylvania Archaeologist*, XXVIII(3–4), Dec., 1958, 145–50). Iroquois sites on the Niagara River indicate a regional specialization in this area, with considerable local cultural development.

Wike, Joyce. Problems in Fur Trade Analysis: The Northwest Coast (*American Anthropologist*, LX (6), pt. 1, Dec., 1958, 1086–1101). Although definitive historical data are lacking, the author believes that the fur trade on the Northwest Coast brought specific advantages to the natives in respect to technological improvements, increased values of indigenous commodities, and a gradual incorporation into a more complex economic system.

——— Social Stratification among the Nootka (*Ethnohistory*, V(3), summer, 1958, 219–41). Among the Nootka of the west coast of Vancouver Island there was a complicated and sometimes unstable social stratification, with property-owning hereditary chiefs, virtually a class, commoners, and slaves. The origin of this type of society has a complex history.

Willey, Gordon R. Archaeological Perspective on Algonkian-Gulf Linguistic Relationships (*Southwestern Journal of Anthropology*, XIV(3), autumn, 1958, 265–72). Complementary to a thesis by Haas, q.v., that Algonkian and Muskogean languages are genetically connected and that the separation took place 5000 to 3000 B.C., the author summarizes the archæological history of the east to see whether there was a similar culture, revealed by archæology, that could be correlated with a single linguistic stock extending from the Great Lakes to the Gulf. He concludes that the Archaic cultures satisfy the requirements of the case, as the dominant type of the area between 5000 and 2500 B.C., and he advances the hypothesis that their makers may well have spoken a proto-Algonkian-Muskogean language.

Witthoft, John. *The American Indian as Hunter.* (Reprints in Anthropology No. 6) (Reprinted from Pennsylvania Game News, Vol. 24, Nos. 2, 3, 4, 1953.) Harrisburg: Pennsylvania Historical and Museum Commission. N.d. 18 pages.

——— *A Brief History of the Indian Hunter.* (Reprints in Anthropology No. 7.) (Reprinted from Pennsylvania Game News, Vol. 25, Nos. 6, 7, 8, 9, 1954.) Harrisburg: Pennsylvania Historical and Museum Commission. N.d. 22 pages. The first of these two pamphlets gives an accurate description of the functions of hunting among the Indians of the northeast, including social and religious implications as well as economic. The second is an outline of the development of Indian life in the same area, as deduced from archæology. The text, which is written in excellent style, provides a useful survey of an important and interesting topic.

Wood, Kerry. *The Great Chief.* Toronto: Macmillan. 1957. 160 pages. A well-written biography of Maskepetoon, the great Plains Cree chief, written primarily for children.

Yampolsky, Helene Boas. Excerpts from the Letter Diary of Franz Boas on his First Field Trip to the Northwest Coast (*International Journal of American Linguistics*, XXIV(4), Oct., 1958, 312–20). On his first trip to British Columbia in 1886, Boas wrote long letters home to his parents as a kind of diary. Extracts from these are fascinating for the light they throw on Boas himself, on his comments on the Indians whom he was meeting for the first time, and on his initial activities in collecting texts in Kwakiutl and Bella Coola.

ZOLOTAREVSKAJA, I. A., E. E. BLOMKVIST, and E. V. ZIBERT. Ethnographical Material from the Americas in Russian Collections (International Congress of Americanists, 32nd, 1956, *Proceedings*, Copenhagen, 1958, 221–31). Attention is drawn to the importance of ethnological material from America in Russian museums, a point illustrated by examples of nineteenth century Tlinkit and Eskimo costumes.

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